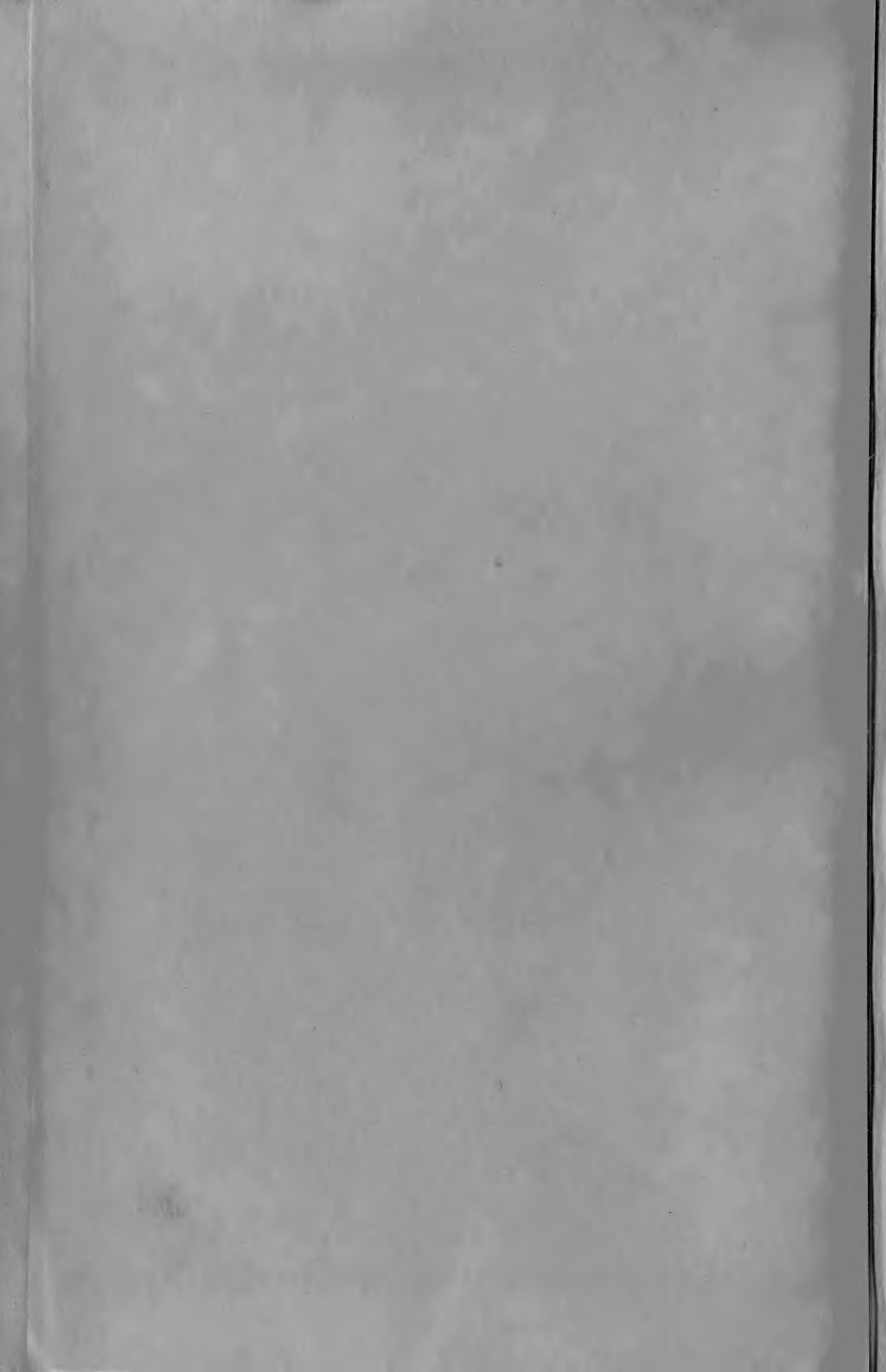


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BRITISH BIRDS

WITH WHICH WAS INCORPORATED IN JANUARY, 1917, "THE ZOOLOGIST."

AN ILLUSTRATED MAGAZINE DEVOTED
CHIEFLY TO THE BIRDS ON THE BRITISH LIST

EDITED BY
H. F. WITHERBY M.B.E. F.Z.S. M.B.O.U. H.F.A.O.U.

ASSISTED BY
Rev. F. C. R. JOURDAIN M.A. M.B.O.U. H.F.A.O.U.

AND
NORMAN F. TICEHURST O.B.E. M.A. F.R.C.S. M.B.O.U.

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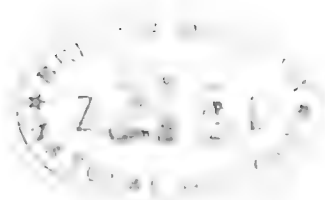
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A Golden Eagle with wing-tip and wrist-slots open.
(Photographed by Arthur Hensok.)

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NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U.

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SAFETY DEVICES IN WINGS OF BIRDS.

BY

LIEUT. R. R. GRAHAM, R.N., M.B.O.U.

(Plate I.)

GLOSSARY OF TERMS USED.

- AIR-STREAM.—The flow of air felt by a bird or any part of a bird owing to its motion through the air.
- AIR-STREAM GRADIENT.—The upward or downward slope of the air-stream felt by a point on the wing of a bird in flapping flight, the angle of slope depending upon the proportion of vertical speed at that point to horizontal speed of flight.
- ASPECT RATIO.—The proportion of length to breadth of a wing. Obtained in figures by dividing the length by the mean breadth.
- BARBS (or RAMI).—Of a feather; the branches that spring at an angle from the shaft, and, in mass, form the webs.
- BARBULES (or RADII).—Of a feather; the minute branches that spring from the barbs. Some are branched, others not.
- BARBICELS.—Of a feather; the microscopic branches that spring from some of the BARBULES. Some are simple spines, others are hooked.
- BLADE.—Of a wing or feather; the whole surface, *i.e.*, of a feather, the two webs considered together.
- CAMBER.—The curve of a wing between the leading and trailing edges.
- CORD.—Of a wing or feather; the distance between the front and rear edges when in flying position.
- COVERT-FEATHERS.—The small feathers of a wing which cover up the gaps between the shafts of the flight-feathers near their roots where they are devoid of barbs.
- CUTTING-EDGE.—Of a feather; a stiff, narrow form of front web, designed to cut the air, that is, to act without the support of another feather in front. Found along the whole front web of the first flight-feather in all birds, but in other feathers only where their front webs are emarginated.
- EMARGINATION.—Of a feather; the stepping down in width towards the tip, either of one or both webs. Only found in certain primary feathers of certain types of birds.
- FLIGHT-FEATHERS.—The principal feathers of a wing, *i.e.*, the visible primaries and the secondaries.
- INCIDENCE.—The angle between the blade of a wing or feather and the line of the air-stream which it encounters at any moment. This angle determines the depth of the furrow a wing cuts in the air.
- LEADING EDGE.—The front margin of a wing or feather in flying position.
- PRIMARY FEATHERS.—The main feathers that spring from the hand of a bird's wing. In some birds the first primary is so small that normally it cannot be seen. The second primary is then considered as being the first flight-feather.
- SECONDARY FEATHERS.—The main feathers that spring from the fore-arm of a bird's wing.
- SHAFT.—The horny quill which extends from root to tip of a feather.
- SLOTS.—Are of two kinds, the wing-tip slot and the wrist slot.

PAN.—Of a bird ; the distance between the fully extended wing-tips when the wings are at full stretch.

TALLING.—The process which occurs when an unduly large angle of incidence is used. It causes a sudden loss of lift and increase of head resistance.

TRAILING EDGE.—The rear margin of a wing or feather in flying position.

VEB.—Of a feather ; one of the halves into which the shaft divides the blade.

WING LOADING.—The weight carried per unit of wing-area with the wings fully extended.

I. SEPARATING WING-TIP FEATHERS.

A NOTICEABLE peculiarity in the flight of a certain number of birds is the way their wing-tip feathers separate, both in flapping and in gliding flight. So wide do the gaps between the feathers become, at times, that the outer parts of the wings take on the appearance of hands with their fingers spread out. One's first thought about the matter is that there is probably nothing in it ; that the feathers separate simply because they are feathers, and as such cannot help themselves ; but, on investigation, this turns out to be one of the most interesting of the many aspects of the flight of birds ; interesting, not only because it brings to light the infinite care and cunning that have been bestowed on the construction of their wings, but also because it demonstrates the possibility of applying some of the lessons that birds can teach us, to the design of flying machines—gliders in particular. When considering such questions we should always humbly remember that birds are the outcome of the law of the survival of the fittest through countless ages of flying, while we have been at it only for about thirty years.

It is fairly easy to explain why the wing-tip feathers separate, but the question of the purpose they may serve in doing so is more of a puzzle. As there appear to be several possible and plausible answers to it, I propose to put them down, and leave those who are interested in the subject to judge how many, if any, of them are worth considering. Personally, I believe that this separation serves different purposes in different types of birds, and in different phases of flight, and that it sometimes serves more than one purpose at a time.

The fact that the wing-tip feathers of some birds separate widely in flight, while those of others do not appear to do so at all, seems to be about the best clue to follow up. Among the smaller species, such as Finches, Warblers, Tits,

Swallows and Thrushes, the peculiarity in question is not noticeable to any marked degree : the wings of these birds vary both in general shape and in the pointedness of the tips. It is only in a certain number of the medium and large-sized birds that separation is really distinct. Of these, Ravens, Rooks, Eagles, Swans and game-birds are some of the more familiar. Without exception, they have comparatively square, or rounded wing-tips, though the wings themselves are of various shapes.

Let us consider a group of birds of corresponding size whose feathers do not appear to separate much, if at all, such as the Woodcock, Snipe, Duck, Pigeons, Cuckoos, Gulls, and nearly all the sea-birds. One could almost be sure that except for their very tips, the feathers of some of these birds always remain packed together. In this group, the wing-tips are distinctly pointed, though again the shape of the wings varies considerably.

As a preliminary basis to work on, we might therefore suggest that separation of the flight-feathers is more likely to be met with in big than in small birds, and in birds that have squarish or rounded wing-tips, than in those that have pointed ones.

In view of the wide divergence between the speed of flapping of game-birds and of other types that have separating feathers, it would appear that the speed at which the wings are flapped has no direct bearing on the matter.

II. THE THEORY OF FLIGHT.

Before going into the matter in detail, it is, perhaps, advisable to describe briefly the manner in which a wing derives power or "lift" from the air. First and foremost, it should be borne in mind that, just as a swimmer obtains forward motion by pushing water backwards, so does a bird counteract gravity by causing air to move downwards. Secondly, it should be remembered that a bird seldom, if ever, beats the air downwards, even in flapping flight. Instead, he makes his wings slice through the air and deflect it downwards, thereby obtaining an upward reaction.

Really, a wing acts on air in much the same way as a plough deals with earth ; a curious simile perhaps, but true in so far as it cuts a furrow and piles up the displaced material on one side—of a wing, the under side.

The air which is displaced beneath a wing accounts for approximately one-third of the total force derived. The remaining two-thirds are generated on the top of the wing in a

way that is not quite as simple. Taking again the simile of the plough: the furrow it cuts is, practically speaking, filled with air as soon as it is made; but the furrow cut by a bird's wing is made at such a speed that the air is unable to fill it immediately. There is nothing else to do the job, because the only other possible object, the wing itself, is being prevented from moving upwards by the muscles that control it. So the furrow remains as a partial vacuum (for the air does manage partly to fill it) and follows the wing wherever it goes, so long as the speed and the angle of incidence are suitable. If the air were sufficiently fluid to fill the furrow immediately it formed, there would be no suction remaining to exert an upward force on the wing, so it is really the SLOWNESS OF THE AIR IN MOVING DOWN that is responsible for the force derived on the top of a wing.

The combined force, one-third from below, and two-thirds above, is known as the Total Resultant Force. It has been found to act at about 90° to the surface of the blade of a normal wing; therefore, by setting his wing at any particular angle, a bird can make it produce a reaction in whatever direction he requires, provided always that the air-speed and the incidence are suitable. It is by holding the wing against this combined reaction of the air that a bird can defy gravity and, by suitable inclination of the surface, obtain forward movement.

Figure 1 shows roughly the lines which the two streams of air follow as they pass the wing. Where the lines are close together the air is under pressure, and where they open out there is tension between the air and the wing,* in other words, the pressure is less than that of the atmosphere.

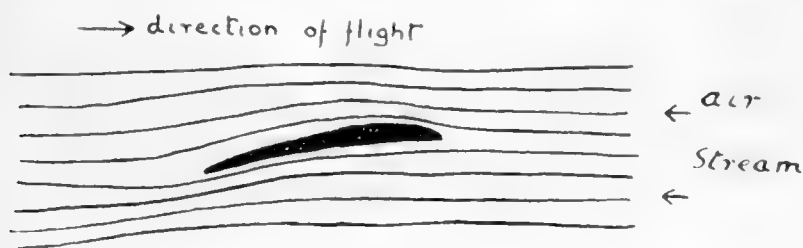


FIG. 1. Section of a wing in flight with lines indicating air-flow. Drawn from a photograph in the *R.A.F. Manual of Flying Training*. Observe that the flow of the upper stream is quite smooth, and that it flows at high speed close over the trailing edge of the wing.

* Though it is technically inaccurate to consider the air-pressures in this way, it is the simplest means of getting a clear view of what happens.

When a bird wishes to glide more slowly, he must make his wings cut a deeper furrow in order to make up in quantity of air displaced for the reduced downward velocity his wings are giving to it.* This he does by increasing their incidence. That is all very well, and it works beautifully, but only up to a certain limiting angle, which, unless it is increased by some special means, is in the region of 15° . (These special means take the form of certain peculiar arrangements of the feathers akin to the Handley-Page Slotted Wing device. They are of particular interest because they vary very much in different species of birds, and are therefore of great help to anyone trying to arrive at an understanding of the differences in their flight.)

As the limiting angle of incidence is approached, the upper of the two air-streams, being deflected more and more sharply downwards in its effort to fill in the furrow cut by a wing, finds increasing difficulty in turning the corner, till finally, and quite suddenly, it gives up the struggle and instead, just rushes on for a short distance and then turns, and, as it were, follows the wing. Thus the smooth flow of air over the top of the wing is broken down and the air-stream begins to form into little whirls, a process known as "bubbling."

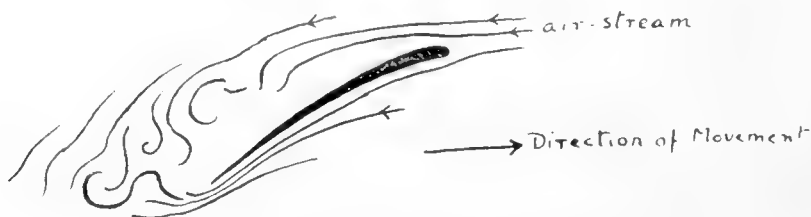


FIG. 2. Section of a wing in stalled flight.

The bubbling is accentuated by the lower-air-stream, which, being no longer kept in place by the even flow of the upper stream over the trailing edge of the wing, is able to flow up and join in filling up the partial vacuum. (One can get a very good idea of what bubbling is, by dragging one's hand at an angle through water.) Figure 2 shows more or less what would be seen if the air-stream were visible.

The important thing to note is that though the air-stream is still being slow in filling the furrow cut by the wing, it is now being SLOW IN MOVING FORWARDS AND UPWARDS, and the

* Speed is of the greatest importance, for by halving the speed a bird reduces the value of the force his wings are producing to one-quarter, unless he increases the incidence. In the same way, he can quadruple the amount of force by doubling the air-speed. The law in accordance with which this happens is that at such speeds as birds attain, the value of the Total Resultant Force varies as the square of the air-speed.

tull of the air on the wing is in the reverse direction—backwards and downwards. So now, a large part of the force of air-reaction is in a backward and downward direction, instead of being at 90° to the wing-surface ; just what is not wanted as a rule. This state of affairs is known as a “stall,” and it always comes into existence when an unduly large angle of incidence is used, either in gliding or flapping flight.

An aeroplane whose wings are stalled commences to fall owing to the lack of “lift,” and then to spin on account of certain little known aerodynamic laws. But, in some of the more modern types, this stalled descent can be controlled in such a way that, instead of spinning, the machine descends on an even keel. This is precisely what some species of birds can do by virtue of their separating feathers, as I hope to show in this article. Without this separation of the feathers they could not do it.

III. EMARGINATION.

That nature had a definite purpose in view when she provided some birds, and not others, with separating flight-feathers, becomes apparent if the shape of such feathers is compared with that of corresponding ones taken from a wing in which separation does not take place. Figure 3



FIG. 3. Above, 3rd flight-feather of a Buzzard ; below, of a Golden Plover.

illustrates this comparison. Observe how the Buzzard's feather (a separating one) is reduced in width from a broad base to a much narrower tip, not gradually, but in a distinct step ; whereas the Golden Plover's (a non-separating one) only narrows down gently the whole way. The feathers illustrated are taken from similar positions in the wing.

This stepping-down in width, known to ornithologists as “emargination,” is always present in the feathers of birds that have separating flight-feathers, sometimes on both webs of the feathers, sometimes only on the front webs, while in certain feathers in any particular wing it is confined to the rear edges. The terms “front” and “rear” are used

here, rather than the usual "outer" and "inner," because we are considering the wing in its working position, fully spread.

The emargination obeys certain definite rules. The front web of the first flight-feather (the first visible primary) is never emarginated; where any marked separation takes place, the rear web is. Then in some wings, the front web of the second feather is the only other emarginated one, but in others, varying numbers of feathers have steps in both webs (five appears to be the greatest number), while in all cases the hindmost feather that has a step has it only in the front web. The result of this arrangement is that when the wing is fully spread the outer parts of the feathers do not overlap, and gaps or "slots" form between them as shown in Figure 4.*

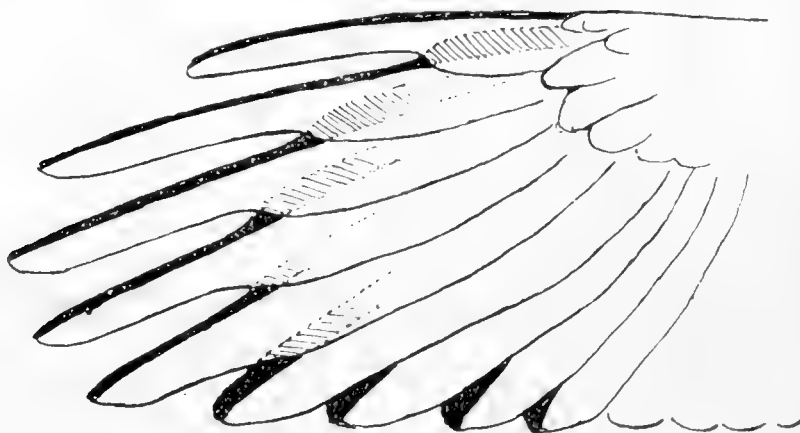


FIG. 4. Right wing-tip of a Buzzard seen from below. The front webs of the feathers are drawn black for emphasis.

For some reason, nature has taken particular care that these slots shall be of fair width, even at their inner extremities, where they might reasonably be expected to form very acute angles, owing to the fact that the feathers radiate from a fairly small centre, the hand of the wing. She has achieved this result by making the webs of the feathers narrower just outside the steps than they are further out towards the wing-tips. The effect is that the margins of the slots are more nearly parallel than they would otherwise be, and the inner extremities squarer (Figure 5).

Though not found in quite all emarginated feathers, this remarkably careful shaping is often to be seen in the feathers of birds with well-developed slots. Its purpose has perhaps something to do with the "drag" that would be induced by air rushing at high speed through a narrow space; with

* In some birds the emargination of the rear webs is very indistinct, particularly in the feathers that form the hindmost slots. The Pheasant's wing is a good example.

nce in flight, or with the need for a good flow of air throughout the whole length of a slot, in order that the full benefit may be derived from it. The slots in the wings of geese are good examples of the type that lack this careful shaping, and these birds are noticeably more noisy in flight than many others. (For comparison see Figure 35.) It also

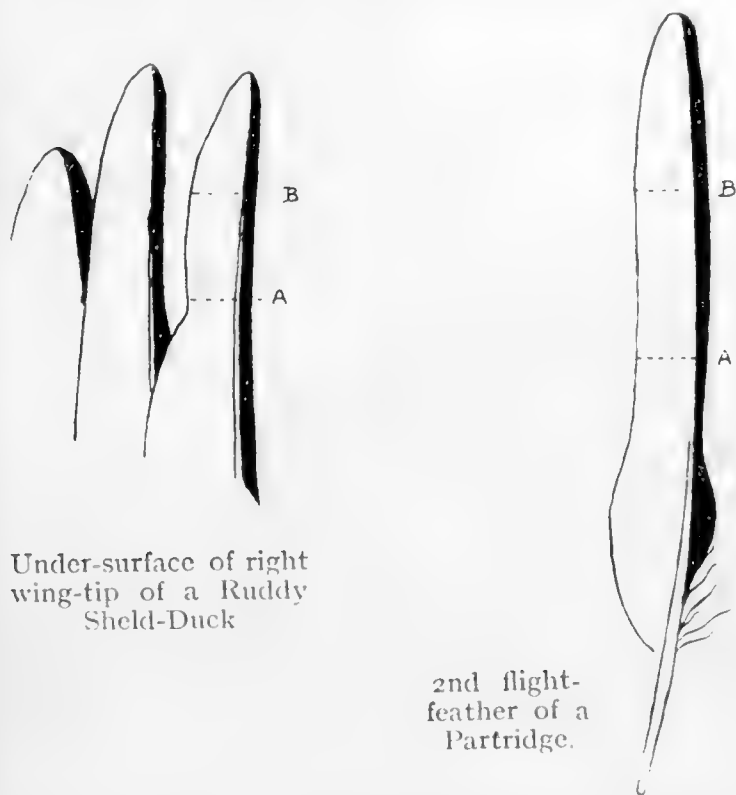


FIG. 5. Typical examples of emargination being greater near the step than at the wing-tip. Both feathers narrower at A than at B.

looks as if this careful shaping is designed to prevent wear on the edges of the feathers, for it must cause the whole slot to open at almost the same moment, instead of the separation starting at the tip and working inwards.

V. BENDING AND TWISTING OF SEPARATED FEATHERS.

Figures 6 and 7 show examples of separation. These birds may either be making a downward beat or just gliding, the camera does not tell us for certain, but for the present purpose that does not matter. All that is required, is to show that the air-stream is striking the wings from below. That it is doing so is quite evident.

In both birds, the separated feathers are distinctly bent in an upward and forward direction, and at the same time twisted, in such a way that their leading edges lie lower than their rear, or trailing edges. First consider the twisting alone. Since no feather has muscular power in itself, this effect must be due to the reaction of the air which the feathers are displacing. The wing, itself, is held or moved by its owner in such a way that the air-stream is striking it at an angle from below and in front (the angle of incidence). The roots and



FIG. 6. A Marsh-Harrier descending. From a photograph.



FIG. 7. The right wing of a Crane seen from below.
(From a photograph lent by Colonel R. Meinertzhagen).

the overlapping parts of the feathers are embodied in, and supported by, this main part of the wing ; but the separated outer portions lack mutual support, and are, to a certain extent, at the mercy of the rush of air which they feel—the air-stream. Having wider webs behind than in front of their shafts, the feather blades cannot help twisting somewhat into line with the upward-slanting stream, because it has more effect on the broad than on the narrow webs. Thus, the angle at which the separated blades of the feathers lie to the line of the air-stream becomes less than that at which the main wing lies. This is a matter of decided advantage to a bird, because it means that he can afford to put his wings at such a large angle of incidence that though they may stall

become comparatively ineffective, he will yet be safe, because their very important outer-parts will automatically remain effective and in an unstalled condition. Further, they will remain so even if he increases the incidence of the wing to several degrees beyond the stalling-angle.

That the separated feathers should bend upwards is only natural since the air-stream is striking them at an angle from below, but that they should also bend forwards seems a little odd. The explanation is that they are yielding to the reaction of the displaced air, which acts, according to the accepted theory of flight, in a direction approximately at right angles to the surface of their blades; and, after they have been twisted, that direction, as can be seen in Figure 8,

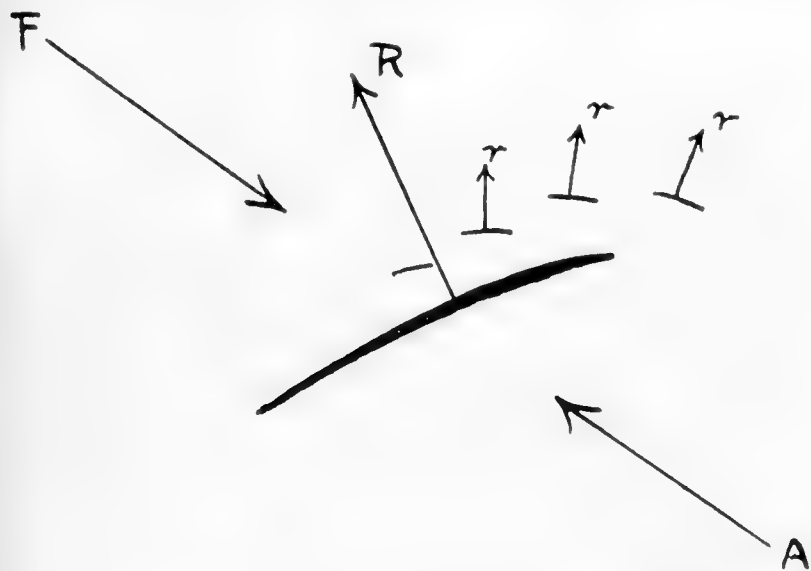


FIG. 8. Diagram illustrating the reason for the upward and forward bending of separated feathers.

A. Direction of air-stream.

F. " " movement of the wing.

R. Total resultant force on the main wing.

r. " " " on each separated feather-blade.

must be upwards and forwards relative to the parent wing. While the slots are opening, each whole feather, pivoting about its root in the hand of the wing, is dragged forward by the force reacting on its twisted tip. When the limit of that movement has been reached, the flexible separated tips bend upwards and forwards, still in obedience to the reaction on the twisted parts of the blades.

V. THE SINGLE WING-TIP SLOT.

A good example of the simplest development of the slot is found in the wings of some forms of duck, the Teal (*Anas*

crecca) for instance. Figure 9 shows the first four flight-feathers of a Teal's wing. Number one feather's front web is very narrow and very stiff from tip to root ; a suitable form for taking the first blow of the air as the wing cuts through it, and for dividing the stream ready for its passage over and under the wing-surface that lies in rear of it. The front web of number two feather is of identical construction, but only for a distance of one and three-quarter inches (A.B. in the figure), measured inwards from the tip ; that is, as far as the step in the web. Inside that point it resembles the front webs of all the other primary feathers that lie behind it in being



FIG. 9. Under-surface of right wing-tip of Teal.

comparatively broad and flexible, and only suited for working at an angle to the air-stream with the shield and support of another feather in front of it.

This indicates that the outer part of number two's front web is a "cutting edge," and that it serves a similar purpose to the whole of the front web of number one ; which, in fact, it does, for when the slot is open it is left isolated through the bending up of number one, to face the air-stream on its own (see Figure 10). Number two feather, itself, does not get bent or twisted, because its rear web is supported



FIG. 10 Duck making a down-beat. The separated tip of the first flight-feather has bent upwards and forwards.

(From a chrono-photograph in Marey's *Motion*. Owing to the peculiar form of photography the series must be read from right to left.)

above and behind by the front web of number three, there being no slot between these two. And the same thing stands for all the other feathers in the wing : they give each other mutual support, which prevents any part of them from being twisted round by the force of the air-stream.

The Teal's cutting-edge is typical of the cutting-edge of all birds, though there is considerable variation in proportionate width in different species. There are other interesting

iations, too: in most game-birds and duck, for instance, the cutting-edges appear to have a bi-convex section, such as is used in the modern high-speed aeroplane wing, and are about twice as thick in section as the rear webs directly behind them. Where they are so thickened, the under-surfaces of the feathers have an unmistakeable silvery appearance. Then there is the wing of the Short-eared Owl (*Asio flammeus*), in which the one short piece of cutting-edge is easily distinguished from all the other leading edges by its comb-like appearance; no doubt, this is something to do with the general "muffling" of the typical Owl's wing. In the wing of a Griffon Vulture (*Gyps fulvus*) the cutting-edges are much more curved down than those of many other birds. This, I suspect, may have something to do with the high lift value required by that bird when soaring at low air-speeds. In fact, cutting-edges make a very interesting study in themselves alone, and I have mentioned only a few of their peculiarities.

When the single slot in the Teal's wing is open, and the flattened tip of the first feather has been bent and twisted by the air-stream, a section taken through the wing at the end-point of the slot would look something like Figure 11.



FIG. 11. Probable flow of the air-stream through a single wing-tip slot. A.—section of the tip of the first flight feather. B.—of the main wing directly in rear of it.

The resemblance of this to a slotted aeroplane wing (Figure 12) is quite evident.

Quoting from the Handley-Page hand-book on the subject: "The slot in the wing, extending along the leading edge, and formed between a small moveable winglet and the main wing itself, prevents a breakdown in the air-flow over the wing at large angles of incidence, and so permits the wing to continue lifting at angles at which stalling would previously have taken place. The stream of air introduced at high speed through the slot from the under surface has the effect of smoothing out the flow of air over the plane, and keeping

it in contact with the upper surface, delaying the incidence of the break-down of the air-flow to angles so large as never to be encountered in actual flight." In other words, it appears that the separated part of the first flight-feather of the Teal gives the air-stream a preliminary downward nudge, so that when it arrives at the downward curve on the top of the main wing it is able to cope with the change of direction, and flow down over it smoothly, without burbling and

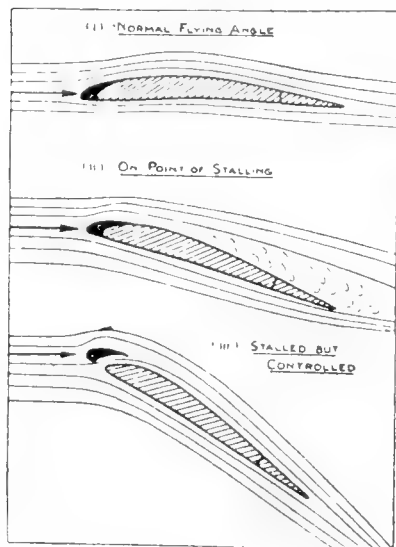


FIG. 12. Diagram illustrating the action of the Handley-Page slot (From the handbook issued by that firm).

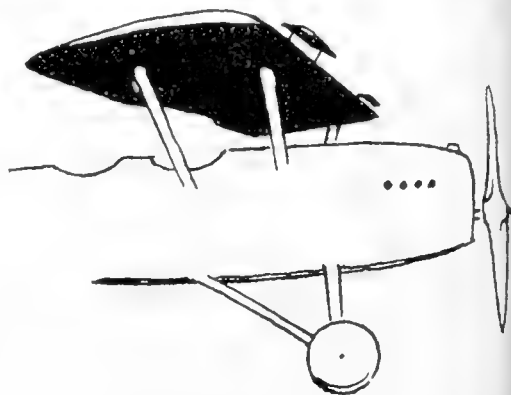


FIG. 13. The appearance of a Handley-Page slot in the open position.

causing a stall. If this really is the case, we can presume that the part of the wing which is situated behind the slot in the Teal's wing, does not stall immediately the incidence becomes so high as to cause the rest of the wing to do so, and that it maintains the value of the lift it is giving, while the main part of the wing is producing "drag" rather than lift.

This excellent property of the wing-tips, given to them by the slots, can be of use to a Teal in several ways. Here is an example. Think of him as he glides down to alight on a flat-calm day, when there is no wind which he can use (by facing it) to reduce his speed sufficiently to let him touch the water without capsizing. His wings have got to produce the "braking effect" required and yet maintain their "lift,"* and they are not of the most suitable type for the work, because the Teal has far higher wing-loading (smaller wings for his weight) than most birds.

* Probably the spreading of the webbed feet, ready to continue the "braking" in the water, assists the wings slightly in this.

The production of a big braking effect requires a strong backward-inclined reaction from the air; that means a large angle of incidence (Figure 14), almost certainly larger than the stalling angle of the wings. In these circum-

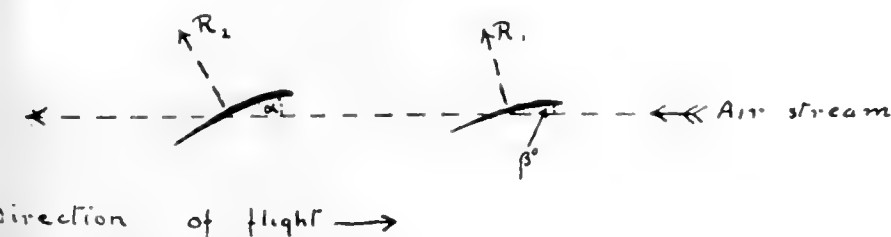


Fig. 14. Diagram showing how braking effect increases with the angle of incidence. Force R_2 points more backward than R_1 because angle α is greater than β .

stances, even if they do stall, it does not matter much as regards "braking", for though the total resultant produced may fall in value, it will be all in the right direction—backwards. But it does matter from the point of view of "control", and that is where the slots come in. They ensure that the front, at least, of the wing, and that the most important part for controlling, will not stall. So this preliminary slide down towards the water appears to develop into a stalled, yet controlled descent, with the body in a horizontal position, or even slightly tilted up in front, not inclined downwards as in a true glide or dive. One can often see commoner birds, notably Rooks (*Corvus frugilegus*), carrying out the same manœuvre.

Having, in this way, reduced his speed somewhat, the bird finds that the controlled stalled descent is going to bring him on to the water with too much downward speed for comfort. To overcome this trouble he starts flapping his wings, at first with very small strokes, little more than quivering of the wing-tips, then gradually increasing the movement until it is almost as vigorous as when he is getting under way at the beginning of a flight. The true reason for the need to start flapping is that he has reduced the speed of the air past his wings so much that they are unable to derive from it the necessary force to obtain braking effect and "lift", and that therefore the wings themselves must be moved to increase it again. The movement which has to be made up for is a forward one, so the wings must be moved forwards; that means a forward and backward flap, which is the form of flapping flight often used by birds when alighting on windless days.

Actually the beat is not horizontal, but it is not far from

it. It is an approach towards hovering flight, and, as can be seen in Figure 15, hovering birds do use this nearly horizontal beat, at any rate in calm weather. The body



FIG. 15. Humming-birds hovering. (From photographs.)

is tilted up at an angle which brings it into nearly the same position with relation to the beating wings as in normal flapping flight, thus doing away with the need for special joints and muscles. This typical attitude, assumed by all forms of duck (and indeed most other birds) when alighting in calm weather, will be recalled by Figure 16. Incidentally this attitude must, in itself, cause a certain increase in the

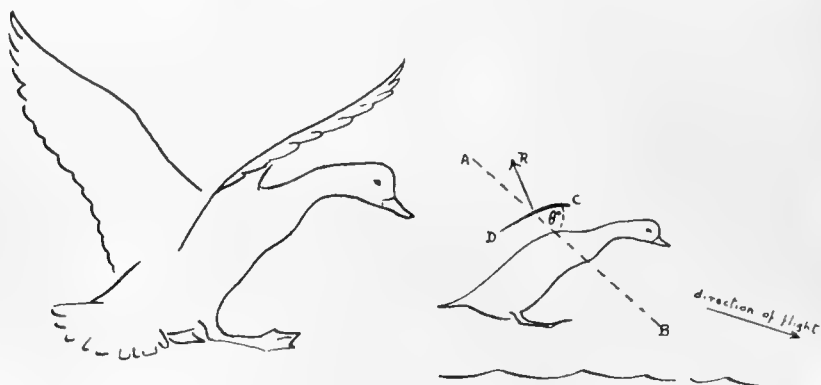


FIG. 16. Left—Typical attitude of a duck while alighting. Right—Diagram illustrating the action of a duck's wing in the down or forward beat while alighting.

braking effect caused by the passage of the body at an angle through the air, and must also reduce the tendency to capsize on touching the water.

The slot comes in very handy in this proceeding, too. Imagine a point on the Teal's wing travelling, during the forward stroke, from A to B (Figure 16) and producing a force from the reaction of the air, roughly, in the required direction R. To do so, the surface of the wing must lie at right angles to that direction, that is, in position CD. The air-stream felt by the wing during the stroke is, practically speaking, in the reverse direction to the stroke, *i.e.*, from B to A

because the bodily forward movement of the bird is now so low as to have but little effect upon it). That means a large angle of incidence and the need for the slot once more to prevent the stalling of the wing-tips.

It is worth noting here that the wing-tips are doing nearly all the work, because the inner parts, being close to the body, cannot be flapped through an arc large enough to produce the air-speed which is essential for the production of force from the air; therefore, it is doubly important that the best should be got out of the tips. The slot allows this to be done by permitting the use of a large angle of incidence.

VI. OPENING AND CLOSING OF WING-TIP SLOTS.

The study of how wing-tip slots are opened and closed is most interesting, because it discloses the presence in a bird's wing of one of the most cunning, economical and amazingly effective devices imaginable.

A bird at rest can spread its wings sufficiently for the slots to open fully; one can see the great birds of prey at the Zoo doing it almost any day. That is evidence that birds certainly are provided with the necessary muscular equipment for the movement, but it does not follow that they use it for that purpose in flight. Here is evidence that they do not. If one takes the wing of a freshly-killed Rook, for example, spreading it so that the feather-tips are just not separating, and holding it at a large angle of incidence (in the nature of 25°) to the draught from a powerful electric fan, the air-



FIG. 17. Lower surface of a Song-Thrush's right wing-tip, with the slots more than fully opened. Gaps appearing beyond the inner limits of the slots and barbs being torn apart from each other are shown.

stream will open the slots by blowing up the broader rear-vebs of the emarginated parts of the feathers. If, on the other hand, this wing is held with the feathers loose and

not pressed together, it can easily be spread so far that gaps appear between the broad parts of the feathers on the body side of the steps in the webs, as in Figure 17. That is, one can over-spread it.

That is how a bird at rest appears to stretch its wings—with the feathers not pressed together. But if one, personally, takes the place of the air-stream which would be

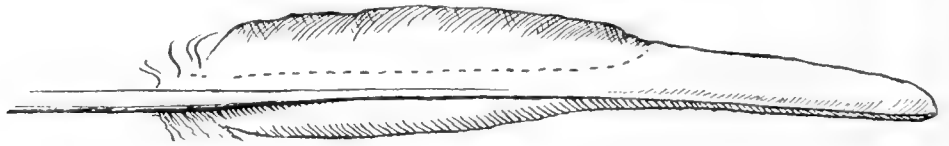


FIG. 18. Upper-surface of a slot-forming feather in a Griffon Vulture's wing. The dotted line shows the limits of the friction area.

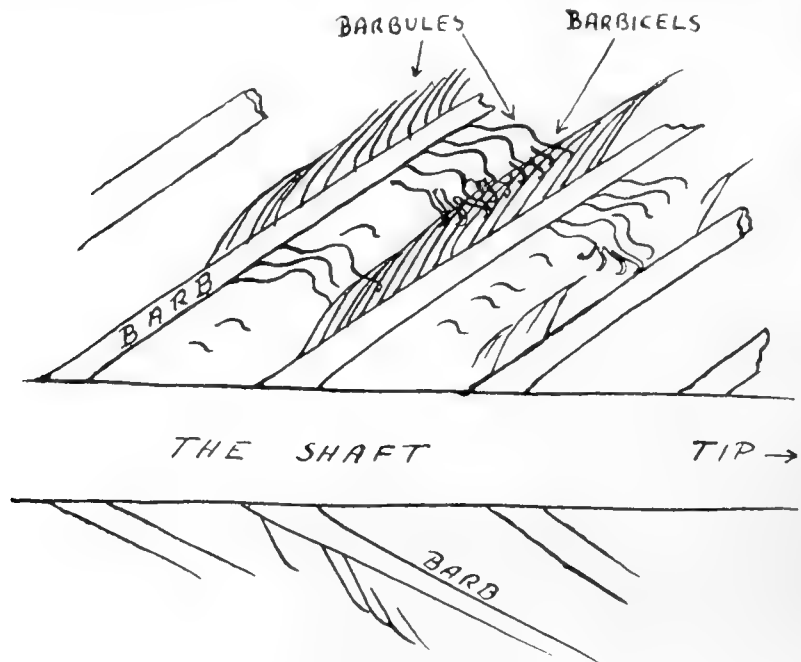


FIG. 19. Construction of the upper-surface of a slot-forming feather from a Griffon Vulture's wing. This section is outside the friction area. Only a few of the branches have been drawn in.

met in flight, and holds the wing so that each feather is pressing up against that which overlaps it, and then one tries to spread the wing as far, it will be found that a brake is quite suddenly put on which seems to lock all the emarginated feathers in the "slot-fully-open" position. Only by tearing apart the barbs of the front webs, where they still overlap the rear webs, can one effect any further spreading. The secret of this braking effect appears, at first, simply to be friction between specially shaped roughened areas on the

feathers, which come into contact at the critical moment. The difference between the texture of the upper-surface of a feather in one of these areas, and elsewhere, can quite easily be seen with the naked eye. Figure 18 shows the extent of one of them in a typical emarginated feather.

But examination of the surface with a microscope indicates that the roughness is more than a friction surface; it shows that the effect is brought about by thousands of tiny hooks which stand out above the main surface, and engage with the ribbed under-side of the broad part of the overlapping feather. These hooks are really an extension of the normal mechanism that holds the barbs of a feather together.

From the shaft of any feather the barbs branch off at an angle inclined towards the tip. From them the barbules (see Figure 19) spring. Those that are on the side of the barbs nearest the root of the feather are simply spines that lie in serried ranks, springing at a fine angle from the barb, but those that are on the side nearer the tip are much more complex in structure. Figure 20 shows a typical example of their normal development. The hooks are designed to

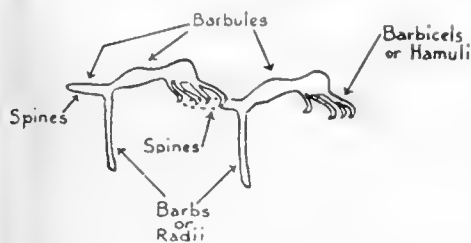


FIG. 20. Section through adjacent barbs outside the friction area.



FIG. 21. Section through adjacent barbs in the friction area.

engage with the spiny barbules on the next barb towards the tip of the feather.

Both hooks and spines are very flexible, and that is why a feather can be made to return to its proper tidy state after one has withdrawn the hooks from their hold on the spines by rubbing it up the wrong way, as, for instance, when using the feather as a pipe cleaner—unless, of course, the pipe is a very foul one; then, nothing will avail.

Figure 20 is a sectional view of two such barbs with the hooked barbicels branching downwards off the tip-side barbules. In the friction area of a slot-forming feather, however, the tip-side barbules do not terminate at the point where the last barbicels branch off downwards, but go on, with a sharp upward bend, as shown in Figure 21, and

bear several more hooked barbicels.* These give the friction area its typical rough appearance, and their purpose is to hook on to the next overlapping feather and prevent over-spreading.

During the earlier stages of the spreading process the protruding under-side of the shaft of an over-lapping feather rides over the friction area of the lower feather and prevents it engaging (this phase is shown in Figure 22), but at the critical moment, when the slot is approaching the fully-open



FIG. 22. Section through the unemarginated parts of adjacent slot-forming feathers with the friction area not engaged.



FIG. 23. As in figure 22, but here the friction area of the lower feather is just coming into operation at Z. A.B is the total breadth of the friction area.

position, the sharply curved-down leading-edge of the upper feather arrives at the forward margin of the friction area of the lower one, and the hooks engage, gradually locking the feathers together, except for a certain amount of "give" due to the springy nature of the barbules and barbicels. Figure 23 shows a section view of two feathers in this position. The narrow parts of the feathers outside the steps in the webs are, of course, in the fully separated position at this final stage of the spreading of the wing. The arrow marked "Z" shows where the friction is greatest.

This friction business does not apply only to slotted wings, for ordinary ones, such as those of the Swallow (*Hirundo rustica*), Woodcock (*Scolopax rusticola*) and Gull, display varying degrees of this locking tendency at the moment when the tips of their feathers are about to separate. The secondary feathers, and also the unslotted primary feathers of birds that have slotted wings, are subject to it as well.

In most wings, the engagement of the friction areas is made the more certain by the upward curl of the rear margins of the feathers, which assists the air-pressure to bring the two surfaces into contact.

One other interesting point about the device is that the front edge of the front web of an emarginated feather is always sharply curved down in the unemarginated part, but in nearly all such feathers (the Vulture and perhaps some

* Only a few wings have been examined for this peculiarity, but it is suspected that all slot-forming feathers possess it to a greater or less degree.

other soaring birds are exceptions, as was mentioned before), it is to all intents and purposes flat from the step outwards to the tip, that is to say, along the "cutting-edge". This peculiarity is quite helpful when one is trying to measure the total length of cutting-edge that any wing possesses. The reason for this difference is that inside the step, the front web has to do the work of digging down into the friction area of the feather in front of it, and working as a limit-stop to prevent over-spreading; but outside the step, its purpose is simply to cut the air.

In a table to be given at the end of this paper will be found the proportion of cutting-edge to length of wing in a number of representative types of birds. It is there called the "Slot Factor."

The apparent action of the opening of the wing-tip slots can now be summed up as follows: When the wing has spread so far that the emarginated parts of the feathers are about to separate, the air-stream, if it has sufficient incidence, forces the broader rear webs of the separated parts of the feathers upwards, so that the blades are twisted towards the line of the air-stream. In this manner the incidence of these separate feathers becomes less than that of the main wing, and consequently the direction of the force reacting on them is more forward. The result is that they all move forward and the slots open wide. At the same time the tips of the feathers bend upward, owing to the absence of mutual support. At a certain moment during this process the individual forward movement of each feather is checked and finally stopped by the arrival of the curved-down leading edges of the still overlapping parts of the feathers at the front margin of the friction areas of the feathers which they overlap. Air pressure from beneath helps these surfaces to engage (the stiff down-curved front webs are not affected by the suction from above), and any further forward movement takes the form of spreading the whole wing, because all the primaries, and to a certain extent the secondaries are then practically locked together.

The need for this automatic limit-stop to prevent over-spreading is strong evidence that the final stages of the expanding of a wing, at any rate a slotted one, are done by air pressure and not by muscular force, except in so far as the breast muscles are preventing the wing from flapping upwards, or are actually pulling it down (as in flapping flight).

This description of the opening process of the slots in a multi-slot wing applies in limited degree to a single-slot one.

(To be continued.)

NEW BRITISH BIRDS AND ALTERATIONS TO THE BRITISH LIST.

BY

H. F. WITHERBY.

THE following additions and alterations have been agreed upon by the British Ornithologists' Union List Committee (see *Ibis*, 1930, pp. 244-247) since the last article on the subject was published in *BRITISH BIRDS*, Vol. XXII., pp. 98-102. The number given before each name below refers to the classified list at the end of Vol. II. of the *Practical Handbook* and my *Check List*.

ADDITIONS.

177A. THE DESERT-WHEATEAR.—*Ænanthe deserti deserti*
(Temm.).

SAXICOLA DESERTI Temminck, Pl. Col., p. 359, fig. 2 (1825—Nubia).
Ænanthe d. deserti Stenhouse, Scot. Nat., 1928, p. 180.

A male example of a Desert-Wheatear in freshly moulted plumage was obtained by Mr. James Stout at Fair Isle, Shetland, on October 6th, 1928. In chronicling this event in the *Scottish Naturalist* (1928, p. 180), Surgeon Rear-Admiral J. H. Stenhouse stated that the bird was very wild and that it had apparently arrived that day after a strong south-easterly wind on the 5th. The specimen was submitted to Dr. Hartert, who reported: "It fits beautifully into a series of autumn specimens of typical *deserti* and stands out from the more rufous sandy birds of *homochroa*."

The typical form of the Desert-Wheatear inhabits Egypt, Nubia, N. Arabia and Palestine.

The western form, *Æ. d. homochroa*, already represented on the British List, inhabits Algeria, Tunisia and Tripoli and extends eastwards to the Libyan Desert and Natron Valley. These two forms resemble one another closely, but the western form has the upper-parts of a more rufous and "warmer" tint of sandy colouring than in the typical and more eastern form. In fresh autumn plumage the perfect grey tips of the feathers rather obscure the sandy colour and the difference is not so obvious as in summer, when the tips of the feathers are worn off. The difference between the two birds was first pointed out by Dr. Hartert in 1912 in *Novitates Zoologicae*, Vol. XVIII., p. 515.

In our *Practical Handbook*, Vol. I., p. 434, it will be seen that of four birds included under *Æ. d. homochroa* only one

(Yorkshire, October 17th, 1885) was definitely assigned to this race, the other three not having been critically examined. I may mention, therefore, that I have recently examined, by the kindness of Mr. W. R. Lysaght in whose collection it is, the bird from "near the sea" (Cley, Norfolk) obtained on October 31st, 1907. This bird, like the Fair Isle one, is in fresh autumn plumage, but the sandy colour of its upper-parts is of a distinctly rufous tinge and the bird compares well with specimens of the western form, *Æ. d. homochroa*.

The third, more eastern (Asiatic) form of Desert-Wheatear on the List, *Æ. d. atrogularis*, has considerably more white on the inner-webs of the primaries than the other two forms and is usually larger.

329A. THE SOUTHERN CORMORANT.—*Phalacrocorax carbo sinensis* (Shaw and Nodder).

PELECANUS SINENSIS Shaw and Nodder, Naturalist's Misc., XIII., pl. 529 and index (1801—China).

In Vol. II., p. 399, of the *Practical Handbook* I pointed out in a footnote that an adult Cormorant in the British Museum, collected at Christchurch, Hampshire, in February, 1873, resembled the southern continental form, *Ph. c. subcormoranus*. This opinion has been recently confirmed by the B.O.U. List Committee, who consider that in consequence the bird should be added to the List.

The name *subcormoranus* was given by Brehm in 1824 to a bird from Holland, and this name was used by Dr. Hartert when he separated the birds breeding in middle and southern Europe from the typical *carbo* breeding in the British Islands, Norway, Iceland and Greenland. A number of other forms, which were considered of doubtful value, had been separated from further east. In the *Ibis*, 1923, p. 459, Dr. C. B. Ticehurst stated that as a result of an examination of the large series at Tring and in the British Museum, he came to the conclusion that the Cormorants found from Holland to China and Japan could not be separated and therefore suggested that the name *sinensis* given in 1801 by Shaw and Nodder to a Chinese bird should stand for this form. This view the B.O.U. List Committee has adopted.

The main difference between this bird and the typical form breeding with us is that on the under-parts it is distinctly greenish instead of bluish. In breeding-plumage the white feathers on the head and neck are usually more plentiful and longer. The bill is often smaller. Dr. C. B. Ticehurst gives the following measurements of those he examined:—

10 adults, Continental Europe and W. Asia, wing 322–355, bill 60–70 mm.
 16 China and Japan „ 322–363, „ 58–73 „
 29 India and Muscat „ 319–364, „ 57–72 „

The Southern Cormorant frequently breeds in trees as well as in cliffs and sometimes in reed-beds.

I take this opportunity of correcting a misprint on page 399 of Vol. II. of the *Handbook*, where under “characters and allied forms” I state that *Ph. c. maroccanus* has “throat and often upper-parts white.” This should read “throat and often upper-breast white.”

ALTERATIONS.

216A. THE AMERICAN NIGHTJAR must be called
Chordeiles minor minor (Forster).

CAPRIMULGUS MINOR Forster, Cat. Animals N. Amer., p. 13 (1771—
 Based on Catesby's description and figure of a bird from Virginia).

When this bird was introduced to the British List (*Brit. Birds*, Vol. XXII., p. 98) the name *Chordeiles virginianus virginianus* (Gm.) used in the *A.O.U. Check-List* was adopted. Unfortunately, it was overlooked that Dr. C. W. Richmond had pointed out (*Auk*, 1917, p. 88) that Forster's *Caprimulgus minor* of 1771 was based on the same bird as Gmelin's *Caprimulgus virginianus* of 1789 and was therefore as valid and had priority.

455. The BRITISH LESSER BLACK-BACKED GULL must be called.

Larus fuscus graellsii Brehm.

LARUS GRAELLSII Brehm, Naturhist. Zeitung, Neue Folge, III., p. 483
 (1857—Malaga, Spain).

At the Sixth International Ornithological Congress held at Copenhagen in May, 1926, the type of Reinhardt's *Larus affinis* in the Royal Museum was exhibited to the ornithologists present and the question as to whether it was a Herring-Gull or a Lesser Black-backed Gull, which has been frequently discussed, was re-opened. The general opinion was expressed that the bird was a *Larus argentatus*, but the case in which the specimen is was not opened and details were not forthcoming.

The question of the measurements of the tarsus and foot has already been dealt with in detail by Mr. F. Iredale when he brought forward this bird as a specimen of our Lesser Black-backed Gull (see *Brit. Birds*, Vol. VI., pp. 360–364), and on this point there will probably always be differences of opinion. The colour of the feet was not recorded and the mantle (probably faded) is now as pale as that of a Herring-Gull

ough Reinhardt stated in his description that it was many shades darker."

Mr. Jourdain has recently fully discussed the whole question in *Novitates Zoologicae*, XXXV. (1929), pp. 82-84, and brings forward additional valuable evidence regarding the shade of colour of the primaries, which seems to me to afford conclusive proof that the bird is a Herring-Gull. Mr. R. Örring, of the University Museum, Copenhagen, has supplied carefully drawn and coloured diagrams of the primaries, and these are reproduced in Plate vi. accompanying Mr. Jourdain's article. Assuming the correctness of the shades of grey shewn in the diagrams as reproduced, there can be no doubt that these are too pale for any specimen of the British Lesser Black-backed Gull.

As the name *affinis* must therefore be rejected, the next name available is *Larus graellsii* of Brehm. This name was given to a bird now in the Tring Museum. It is dated "Malaga, 21.10.1856, male." It is in full moult and would, I think, have become entirely adult in plumage had the moult been completed. The general appearance of the mantle is rather dark owing to the presence of old worn feathers, but the new feathers are as pale as those in typical British specimens of the Lesser Black-backed Gull, as also are the inner webs of the primaries. The crown and nape are heavily streaked. The wing measures 423 mm., the outer longer primaries being worn old ones. The tarsus is 66 and the bill from the feathers 50.

When Dr. P. R. Lowe first differentiated our breeding Lesser Black-backed Gull as distinct from the dark-backed typical bird, and named it *Larus f. britannicus* (*Brit. Birds*, Vol. VI., pp. 2-7), he was mistaken in stating (p. 3, footnote) that the type of Brehm's *Larus graellsii* was missing. He himself appears to have examined the bird and identified it as of this form, as will be seen by a reference to the list of specimens given on p. 6.

476. The COMMON CRANE must be called
Grus grus grus (L.).

Opinion 103, rendered by the International Commission of Zoological Nomenclature (*Smithsonian Miscellaneous Collections*, Vol. 73, No. 5, September 19th, 1928) decides that the type of *Grus* Pallas 1767 is *Ardea grus* Linn. 1758. The question of the use of this generic name is a complicated one which need not be gone into here, and it will suffice to say that the B.O.U. List Committee accept the Opinion of the International Commission.

OBITUARY.

KENNEDY J. P. ORTON.

KENNEDY JOSEPH PREVITÉ ORTON, F.R.S., M.A., PH.D., Professor of Chemistry at Bangor (University of Wales), died on March 16th, 1930, in his 58th year. At St. John's, Cambridge, at Heidelberg, and University College, London, his career was brilliant, and before he was given the Chair at Bangor he was for five or six years lecturer and demonstrator at "Barts." Climbing and ornithology were his recreations, and he was a keen bird-protector; undoubtedly many of the Ravens and Peregrines of North Wales owe their survival to his watchful care and energetic action, and probably no one knew more than he did about the Choughs of Snowdonia. On the moors, braving the wrath of keepers or their masters, he made a point of destroying the illegal pole-traps which were common long after the Act of 1904. In a letter written in March, 1911, he described minutely a Hooded Merganser which he watched in the Menai Straits, near Bangor, in much the same place where Eyton shot his bird in the winter of 1830-31. In December, 1928, he described to me the great westward flight of Lapwings and other birds during the N.E. gales of the 8th to 10th, which he observed on the north coast of Anglesey; these "vast flocks" were, no doubt, making for Ireland and reached there safely, for it was at the end of the month that birds crossed the Atlantic. He contributed various interesting notes to *BRITISH BIRDS* and helped with the Heron Census, but to his personal friends it was his conversation and private correspondence that were most valuable. He was careful about detail, did not jump to conclusions and he had always something interesting to tell. Orton will be sadly missed, not only by his colleagues at Bangor, but by the many friends who met him on the rocks and hills.

T.A.C.

NOTES

ROOKS COLLECTING RUBBER OBJECTS.

THE Rooks (*Corvus f. frugilegus*) of Wanstead Park have a strange custom which may not have been brought before the notice of readers of *British Birds*. For more than twenty years they have been in the habit of collecting rubber bands and scraps of articles made of rubber. On the ground, beneath the nesting trees, we picked up to-day (May 4th, 1930) various types of rubber bands, e.g., from bottles, also the flat bands used in offices for papers. We also found sections of a child's balloon, a piece of bicycle tyre and an inch of rubber used for mending punctures. The bands are usually unbroken, though two or three torn fragments were found to-day. The articles are not found in connection with the food pellets, so there is no evidence that they have been swallowed by the birds.

The Wanstead Park Rookery is on an island in the lake, and adjoins the heronry. It is strictly protected, but the London Natural History Society get permission for an annual expedition to it and this took place to-day. The keeper told us that the rubber objects are sometimes so plentiful that he could easily gather a quart of them. I myself collected a large number eight years ago and Miss Foster has known of the habit for over twenty years.

It would be interesting to get evidence of the same thing happening in other rookeries. The keeper informed us that the objects are brought chiefly from a sewage farm some miles away. The reason of the partiality of these Rooks for rubber is an enigma.

A. HIBBERT-WARE.

BULLFINCH STRANGLER BY NEST HORSE-HAIR.

On May 17th, 1930, at Trefnant, Denbighshire, I found an apparently unfinished nest of a Bullfinch (*Pyrrhula p. nesa*) about 12 feet from the ground, in ivy growing on a small Scots fir-tree. Happening to pass that way on the afternoon of the same day, I heard the repeated call-note of an anxious Bullfinch, and glancing below the nest, found the female lying dead on the ground, very thoroughly and efficiently strangled by a horse-hair, no doubt from its own nest. Some form of noose had been formed by the hair, which was so tightly secured that all reasonable force failed to remove it.

W. M. CONGREVE.

PROBABLE RICHARD'S PIPIT IN KENT.

ON April 24th, 1930, I saw a strange Pipit, which I believe to have been a Richard's Pipit (*Anthus r. richardi*) near Sea-brook in Kent.

The bird was on a piece of waste land, and my sister and I watched it for some five or ten minutes at a distance of about twenty yards.

The bird was obviously a Pipit, from its general brown colouring, fine beak and Wagtail-like habit. It was much larger than a Meadow-Pipit, and on looking carefully at the plumage I noticed at once some bright buff on the flanks. Then, suspecting it to be one of the rarer Pipits, I noted details of the plumage with as much particularity as possible.

A narrow streak of bright buff extended along the flanks, just below the edge of the wing, and below that was a paler sandy streak which merged into the dull breast-colour. The flanks were entirely without spot, as were the lower breast and middle throat.

The breast spots were confined to a gorget (more like a Sky-Lark than a Pipit) and to the sides of the throat.

The upper plumage was very definitely streaked, longitudinally, dark and light brown. The legs were light in colour.

ALICE V. STONE.

PIED FLYCATCHERS IN BUCKINGHAMSHIRE AND MIDDLESEX.

As the Buckinghamshire records of the Pied Flycatcher (*Muscicapa h. hypoleuca*) appear to be scarce, it may be of interest to record that on April 30th, 1930, I observed a male of that species at Whaddon. The bird, which was in fine plumage, was seen clinging to an elder sapling in a small plantation and remained more or less stationary at a very close distance for several minutes. HENRY L. COCHRANE.

I had excellent views of a Pied Flycatcher (*Muscicapa hypoleuca*) which visited my garden at Stamford Hill on May 2nd, 1930. S. AUSTIN.

WESTWARD MIGRATION OF SWALLOWS AND MARTINS IN NORTH KENT IN AUTUMN.

I WAS staying at Herne Bay, Kent, in September, 1929, and witnessed a migration of young Swallows (*Hirundo r. rustica*) and House-Martins (*Delichon u. urbica*) which continued intermittently for some days.

As the house at which I was staying was on the front, I

all excellent opportunities of watching them, and the following are the notes I made.

September 19th, 1929.—Large and continuous flocks of House-Martins and young Swallows flying E. to W. against a strong west wind, which was described in the west of England as a gale! They followed the coast-line partly over the sea and partly over the land.

I first saw them from my bedroom window at 7.30 a.m. (summer time). I took train to Margate and saw them still flying all along the line in large numbers until the train reached Westgate at 10.30 a.m. (summer time). On reaching Margate, none were to be seen, so that they were either coming in from the sea, or else cutting across the Isle of Thanet and missing Margate.

Local House-Martins at Herne Bay and Swallows at Margate were still feeding young in the nest.

September 22nd, 1929.—House-Martins and young Swallows in parties of six to twelve birds, flying E. to W. against a west wind during the whole morning and afternoon.

September 28th, 1929.—Since the 22nd September and up to-day the strong west wind had dropped and there have been no migratory Swallow birds, but to-day the west wind is again strong and large and continuous flocks of House-Martins have been flying E. to W. against it, from 10.15 a.m. (summer time) to 1.15 p.m. (summer time), when the light ended.

October 1st, 1929.—Local House-Martins feeding young in the nest at Herne Bay and Canterbury.

October 3rd, 1929.—A large number of House-Martins on Herne Bay front at 5.45 p.m. (summer time) and feeding on a species of *tipula* (daddy long legs) which were flying in confusion. Calm and warm weather.

October 4th, 1929.—The usual number of local House-Martins flying round with young out of the nest, which they were feeding in the air.

October 5th, 1929.—House-Martins, Sky-Larks, Meadow-pits and Linnets in batches of from 6 to 50 individuals, migrating all the morning E. to W. against a strong west wind along the coast.

October 6th, 1929.—Local House-Martins flying round all day and at dusk clinging to the stucco on the sheltered side of a house.

October 7th, 1929.—Local House-Martins gone at Herne Bay.

C. W. COLTHRUP.

SWALLOW IN CHESHIRE IN DECEMBER.

ON December 4th, 1929, I watched for some time a Swallow (*Hirundo r. rustica*) hawking over a railway embankment and an adjoining orchard at Hartford, Cheshire. I saw it again on the following day at the same place. JOHN MOORE.

MALE RING-OUZEL BROODING.

THE accompanying photograph, which I took quite recently on the moors near Llanfihangel, Denbighshire, may prove of interest as showing that the male Ring-Ouzel (*Turdus t. torquatus*) does occasionally assist in incubation. The male and female birds of this pair took regular turns at brooding, for, as often as not, I found either bird on the nest. Incidentally, the female was much the more shy of the two.

M. V. WENNER.

FOOD OF TAWNY OWL.

IN the nesting-hole of a Tawny Owl (*Strix a. sylvatica*) near Bristol, which contained two young about a fortnight old on May 3rd, 1930, I found the remains of a Moor-Hen (*Gallinula ch. chloropus*). The head, neck and breast had been eaten, but the remaining parts were fresh. On May 12th, on visiting the nest again, I found many feathers (including tail- and wing-feathers) of a Green Woodpecker (*Picus v. virescens*), indicating that the whole bird had been torn up.

As the *Practical Handbook* does not mention the Moor-Hen, and only one case of the Green Woodpecker, as food of the Tawny Owl, the above seem worth recording.

H. H. DAVIS.

HEN-HARRIER IN YORKSHIRE.

ON April 21st, 1930, I was walking along a lane leading up to Harwood Dale Moor, near Staintondale, Yorks., when a large hawk flew overhead. It descended to about two feet above the heather and quartered the ground over a wide area, finally disappearing over the skyline. During this time I had it in view with field-glasses and noted the following particulars: its colouring was mainly dark tawny-brown above; under-parts considerably lighter, and a rather conspicuous white rump. Its flight reminded me at once of the Montagu's Harriers which I had seen in the fens, but the area of white on the rump seemed much larger and more conspicuous, and I came to the conclusion that it was a female Hen-Harrier (*Circus cyaneus*).

PETER C. ELLIS.



Male Ring-Ouzel incubating.
(*Photographed by M. V. Wenner.*)

REDSHANKS BREEDING IN CARMARTHENSHIRE. THE *Practical Handbook* states that the Redshank (*Tringa t. totanus*) breeds "sparsely in Wales," and I do not know of any published record of its breeding in this county. For some years now I have been confident that it has bred in the neighbourhood of Laugharne, and early in May, 1929, Miss E. Falkener found a nest of this bird among dwarf willow. On April 20th, 1930, I flushed a Redshank from a nest of four eggs hidden in a small tuft of grass in the same locality.

J. F. THOMAS.

RECOVERY OF MARKED BIRDS.—*Correction*.—On page 301, Vol. XXIII., No. R.R.2792 was put under the heading of "Oystercatcher", but this bird was a Lapwing, and should have been under the heading of that species.

REVIEW.

Report on Scottish Ornithology in 1928. By Evelyn V. Baxter and Leonora Rintoul. Reprinted from *The Scottish Naturalist*, 1929.

WE much regret to learn from the introduction to this Report that it is to be the last of the series. The Report has for many years been most useful in tracing the movements, status and distribution of birds in Scotland. It is said to have served its purpose, but with this we cannot agree since there is still a great deal to be learnt about the exact distribution of birds in Scotland, and unless this Report is issued we think many useful observations will go unrecorded. Instead of the Report it is proposed to concentrate on special enquiries, such as a census of the birds in the smaller Scottish islands, but not all can undertake to help in such enquiries, while others could do both this and the old work, and we cannot but think that a great mistake is being made in bringing these valuable reports to an end.

The following items of special interest not hitherto referred to in our pages appear in the present Report, all the dates referring to 1928.

SCARLET GROSBEAK (*Carpodacus e. erythrinus*).—One at Fair Isle, October 10th.

CIRL BUNTING (*Emberiza cirrus*).—Two seen at Eglinton (Ayr.) on May 8th and one caught at Parkhill (Forfar.) on November 27th.

ORTOLAN BUNTING (*E. hortulana*).—One at the Bass Rock on May 2nd, some at Fair Isle on May 4th and one October 9th.

WOOD-LARK (*Lullula a. arborea*).—One at Fair Isle on January 30th and two on February 4th.

RICHARD'S PIPIT (*Anthus r. richardi*).—Two at Fair Isle October 5th.

YELLOW-BROWED WARBLER (*Phylloscopus h. præmum*).—At Fair Isle, September 20th to 28th.

SIBERIAN LESSER WHITETHROAT (*Sylvia c. affinis*).—In addition to the two already reported at Fair Isle (*antea*, Vol. XXIII., p. 70), two others between September 29th and October 2nd.

SNOW-GOOSE (*Anser hyperboreus* ? subsp.).—Three were reported in Islay in the winter of 1927-8 and two in 1928-9.

SCANDINAVIAN LESSER BLACK-BACKED GULL (*Larus f. fuscus*).—Reported from Berwickshire, May 6th; Argyllshire, May 22nd and Papa Westray (Orkney), August 8th.

ARCTIC SKUA (*Stercorarius parasiticus*).—Found breeding on "another island in Orkney."

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EV. F. C. R. JOURDAIN, M.A., M.B.O.U., H.F.A.O.U., F.Z.S., AND

NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U.

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SAFETY DEVICES IN WINGS OF BIRDS.

BY

LIEUT. R. R. GRAHAM, R.N., M.B.O.U.

(Continued)

VII. THE MULTIPLE WING-TIP SLOT.

One outstanding difference between the multi- and the single-slot wing is that in the former the slots extend right across the wing from front to rear. They must, therefore, serve some purpose additional to that of simply delaying the moment at which the wing-surface in rear of them stalls. With the notable exception of the game-birds, most of the bigger birds which have a high development of the multi-slot wing, such as Rooks, Ravens, Eagles, Buzzards, etc., are in the habit of soaring, or at least of gliding very slowly if they do not actually soar. As any experienced airman knows, the control of lateral balance becomes increasingly difficult as air-speed is reduced, so one is led to suspect that there may be some connexion between slots and lateral control at the low air-speeds used by soaring birds.

Think of one of these birds as it glides slowly with wings set at a comparatively large angle of incidence* in order that it may make the best use of the low air-speed. If the tips of the wings were solid (*i.e.*, un-slotted), and the bird wanted to alter its lateral attitude (put on "bank"), a small change of the incidence of one wing-tip would only have the effect of altering the lift slightly on that side and of tilting the bird a little one way or the other; but if the feathers in that wing-tip were already lying near the angle of "no lift" (as they would be if the wing were slotted) a small alteration of their incidence would either double the lift they might already be giving, reduce it to nothing, or actually reverse the direction of force and convert it into a downward reaction. In other words, a small movement of the control surfaces of a slotted wing has the same effect as a large movement in an unslotted one, and, further, a slotted wing-tip can go on giving lateral control at far greater angles of incidence of the main wing, than a solid one can. It is the automatic twisting of the emarginated parts of the primary feathers towards the line of the air-stream and the angle of "no lift" that achieves this desirable result.

* Sir G. T. Walker, in his paper on this subject, which appeared in the *Journal* of the Asiatic Society of Bengal, in 1924, makes out this incidence to be in the region of 28° for a soaring Vulture.

There is a parallel to this controlling device in a certain man-made flying machine called the "Pterodactyl" (the word means "wing-fingered"). It is really, with all due respect to its designer, only an experiment as yet; but it may well be the prototype of big things to come, for it can be made to perform efficiently in the air at lower speeds than can be used with any other modern fixed-wing aeroplane. Its best trick is the same controlled stalled descent as was described on page II, with this small difference, that in the Pterodactyl the controlling surfaces at the wing-tips are not twisted towards the line of the air-stream by means of air-reaction: instead, they are moved by the pilot himself. They consist of swivelling flaps which, in form, are prolongations of the wing-tips, and so have nothing in front of them (as the ordinary aileron has) to disturb the flow of the air before it reaches them. They can be moved, like ordinary ailerons, in opposition to each other, by means of sideways motions of the control stick; but they can also be made to move together by pushing the stick backwards and forwards. Thus, when a controlled stalled descent is being made, the pilot, by pulling the stick back, can turn both flaps so that their front edges are lowered, and their trailing edges raised, a movement which brings them into line with the air-stream. Then, if lateral control is required, sideways movements of the stick will make them work like normal ailerons, in opposition to each other.

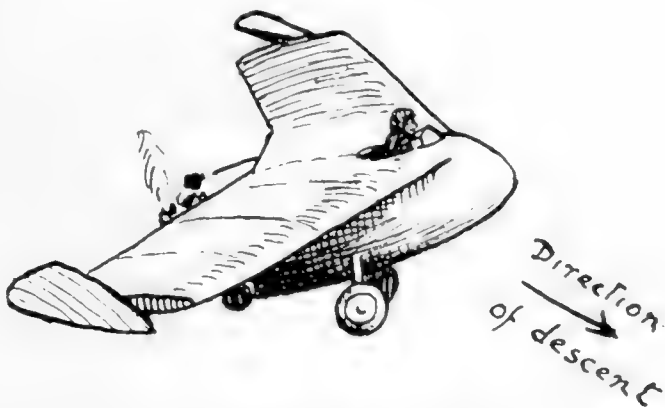


FIG. 24. The Pterodactyl tailless monoplane. A sketch taken from a photograph to show the position of the controllers in a stalled descent.

Figure 24 shows what the Pterodactyl looks like when it is carrying out such a flight. The fact that it is tailless has no bearing on the present discussion, but it may be as well

to say, here, that the control flaps, being set so far back on the machine, can be used in the place of the elevators of a normal tail when they are moved in conjunction.

No doubt Nature, having feathers to work with in place of the sheets of metal or fabric which we use, finds it more economical to employ a number of small surfaces for controlling than a single large one, such as the controller of the "Pterodactyl"; but it is just possible that investigation of the matter might reveal something of use to aircraft designers. A comparison between Figures 24 and 6 is illuminating in this respect.

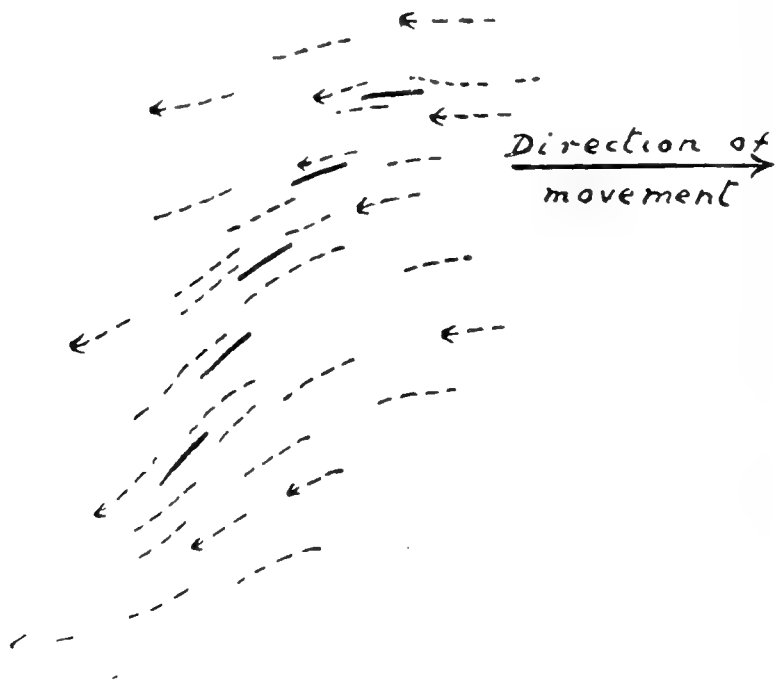


FIG. 25. Section showing the probable flow of the air-stream through the wing-tip of the Eagle in Plate 1.

Figure 25 illustrates another way of looking at this anti-stalling effect of the multi-slot wing-tip. It should be considered in connection with Plate 1, as it is meant to be a diagrammatic sketch of a section taken through the separated wing-tip feathers of the left wing of the Eagle shown in Mr. Brook's photograph.* The dotted arrows represent the probable flow of the air-stream. They are drawn by guessing, in the light of our present knowledge of the behaviour of air, at the way in which one would expect the air-stream to behave on meeting such an obstacle as this slotted wing-tip.

Working backwards from the first feather, each blade in

* We are much indebted to Mr. Arthur Brook for having allowed us to reproduce his photograph of a Golden Eagle in Plate 1, which appeared in the June issue.—Eds.

turn deflects the air-stream in a downward direction, so that the one behind it does not have to twist through such a large angle to set itself at a similar angle of incidence. In this way the direction of flow of the air-stream is changed step by step through a greater angle than the stalling angle, without the burbling that would certainly occur if the attempt were made to do it all in one act.

Each feather is acting for the benefit of its "next astern" in the same way that a Handley-Page auxiliary winglet does for an aeroplane's wing; while it is, at the same time, producing a useful reaction in an upward direction, with either a slightly backward, or slightly forward inclination, depending upon its position in the wing.

The reason for the bending up of separated feather-tips has been discussed, but the question whether they serve any useful purpose in so doing still remains. There can be little doubt that when so bent they improve stability at low air-speeds. The surfaces of the blades of the feathers, instead of facing upwards and downwards, point more or less sideways, and so they become little keel-surfaces, and, placed as they are at the ends of the long levers of the wings, their effect must be considerable. Really they serve the same purpose as the "dihedral angle" (upward inclination of the wings from root to tip) used by aircraft designers to give lateral stability.

VIII. THE RELATION BETWEEN SLOTS AND THE SHAPE OF WINGS.

It was observed at the beginning of this paper that slots are not particularly noticeable in the wings of small birds in flight. The reason for this is that the eye fails to see them because they are very small, and the wings usually move at a great speed. The truth is that many of the small birds are very well equipped with slots. A Blue-Tit, for instance, has five; a Song-Thrush (*Turdus philomelus*) three; the Robin (*Erithacus rubecula*), Tree-Creeper (*Certhia familiaris*) and Long-tailed Tit (*Egithalos caudatus*) have four; but in none of these birds is their development so marked as in some of their large relations. Figure 26 shows two views of a Thrush's wing with its slots fully opened, and Figure 27 similar views for comparison of the unslotted wing of a Swallow at full spread.

As a rule, the slots of small birds are formed more by the emargination of the front webs of the feathers than of the rear ones, but these rear webs are usually so thin and flexible

that they must be very easily persuaded to blow upwards, in such a way as to clear the leading edge of the next feather behind. In moulted feathers, one often finds that the trailing

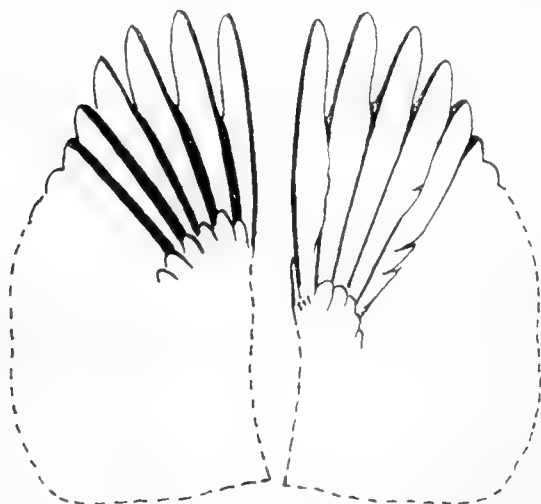


FIG. 26. Upper and lower surfaces of the left wing-tip of a Song-Thrush.



FIG. 27. Upper and lower surfaces of the left wing-tip of a Swallow.

edges have been worn to shreds opposite the emarginated front web of the next feather in rear by continual engagement and release with it.

Small birds probably derive a certain improvement in lateral control from their slots, but they do not often appear to carry out the stalled descent, and they certainly never do anything in the nature of soaring; they use a quick flap for a great part of their time in the air. Bearing this, and the somewhat different construction of their slots, in mind, we might do worse than try to find some other advantage that they may derive from them.

All small birds that are well-equipped with slots possess comparatively short, square-tipped wings; just the opposite in shape to those of the few that have no slots at all; and the slots seem to vary in number and development so strictly in accordance with the shape of the wings that one might almost formulate a law governing the matter.

Compare the wings of the smaller birds among those shown in Figure 28. The Swallow's is the longest and thinnest (relatively) and has no slots, though the tips of the first two flight-feathers are permitted by the friction areas just to separate for a distance of about half an inch inwards from their points (Figure 27). Then comes the pointed wing of the Starling, with two very short slots, and of the Quail with about

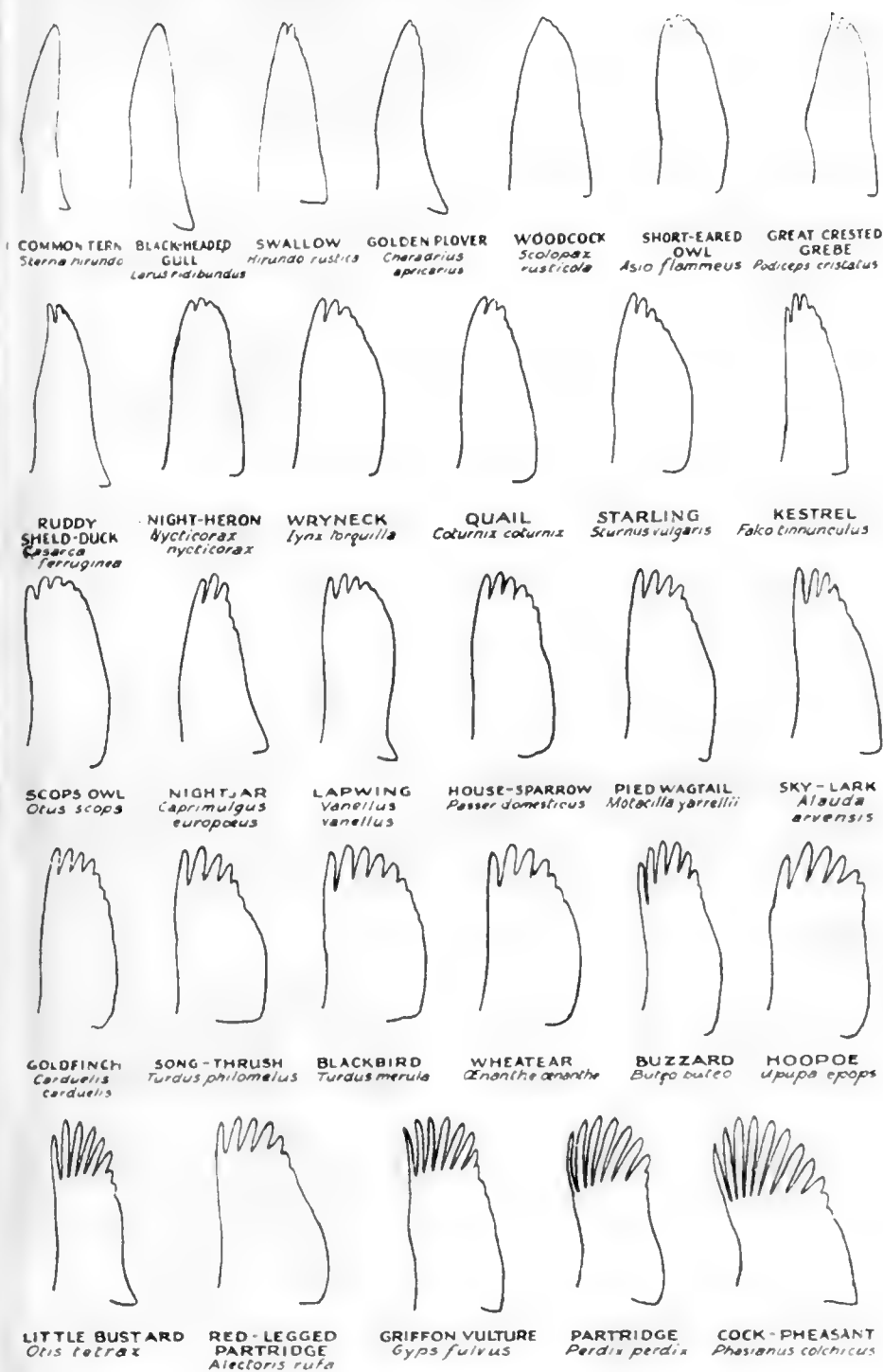


FIG. 28. Wings of a number of representative types of birds in the fully-spread position. All are reduced to a common size for the sake of comparison.

the same development. The latter's wings are comparatively long and narrow. The Wryneck has exactly the same length

of slot (1.2 in.), but that is relatively a better equipment, because its wing is 1.3 in. shorter than the Quail's, yet of the same breadth. The Wheatear, with its much broader and squarer wing has three quite well-developed slots, as also have the square-tipped wings of the Goldfinch and the Thrush.

Here we seem to have an indication of the use of slots in the wings of small birds. It has long been known that the ideal aeroplane wing, from the point of view of "lift" alone, is one of infinite span, because such a wing, if it existed, would have no tip over which the air could escape sideways. Air, like other things we know, will avoid doing a job of work if it possibly can. Some of the air underneath a wing, instead of lifting a bird by allowing itself to be forced downwards by the action of the wing, will slide out sideways*, or even move upwards over the wing-tip into the region of reduced pressure to join forces with another stream of air that is doing no good. This other stream consists of air that is moving in sideways to assist in filling up the partial vacuum on the top of the wing.

All this air that is moving sideways and upwards constitutes a waste of energy, because the only way a wing can obtain lift is by causing air to move "downwards." The broader a wing-tip is, the greater will be the amount of air that thus tends to circulate around it, and the less efficient the wing will be.

In Figure 29 the rectangular shapes, A and B, represent two wings of equal area, but A is three times as long as B, and therefore one-third of its breadth. Suppose that a particle of air strikes the leading-edge of wing A at point X. It endeavours to escape sideways from the pressure, but fails to do so before reaching the trailing edge at Y. That means that the wing has got full lifting value out of it; but any particles that strike the leading-edge outside point X will make good their escape without completing their job, so we can suppose that the area affected by wing-tip air-spill is the triangle XYZ.

In wing B we might reasonably expect this area to be far larger (the triangle RQP) with a correspondingly greater loss; but if the tip is split up into a number of narrow winglets (keeping the total area the same), as in wing C, the affected area will consist only of the sum of the little shaded triangles in wing C, and that is a good deal smaller

* The reason in technical language, is that a gas which is compressed, will tend to expand equally in all directions. By the same token, it will tend to flow into a space where there is a reduced pressure; that applies to the top of the wing.

in RQP. That is what Nature appears to have done to the short, broad wings of birds that cannot afford to have long, narrow ones. The actual result is that circulation of air from the lower to the upper-surface of the wing-tip is reduced.

It is interesting to note that the slotted areas of a good many of the wings shown in Figure 28 bear a distinct resemblance to the affected areas of wings A and B.

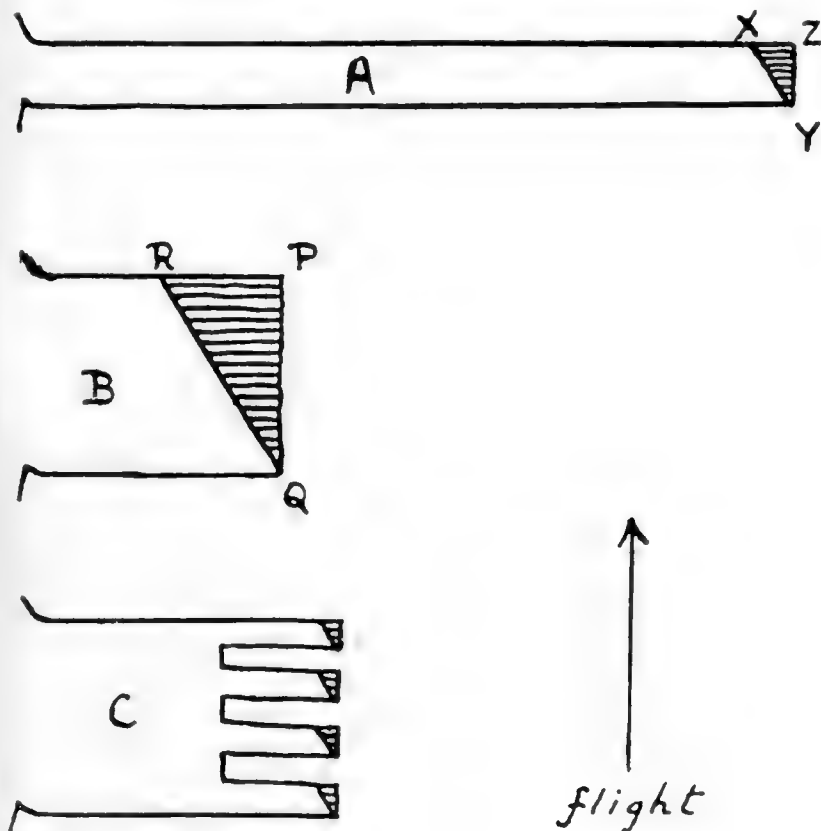


FIG. 29.

But why should we confine ourselves to small birds in considering this theory? Surely all birds that have separating wing-tip feathers must derive a certain amount of this benefit from them. The idea is supported by the fact that some of the really big birds that have long and narrow wings, compared with, say, a Wheatear, are well supplied with slots. Vultures, Cranes and Swans are good examples (Figure 30). Now compare the shape of their wing-tips with those of the big birds that have no slots, the sea-birds; the unslotted wings are, without exception, the more sharply

pointed. Square tips are large tips, and the loss from them will be large unless they are slotted.



FIG. 30. Left, Crane; right, Swan (sketched from photographs).

The reason why some birds, and not others, can afford to have pointed tips to their wings is not too clear, but it seems that a pointed tip must be longer than a square slotted one to have the same value; and whereas a bird that always flies in the open, such as a Sea-Gull or a Swallow, will not find that his long wings get in the way, one that lives among trees and bushes, and other things that obstruct the air, if so equipped, would find them a decided encumbrance.

So the root of the matter would appear to be this: that if his method of living will permit, a bird will have long, narrow, pointed wings of efficient aerofoil shape because that is the nearest he can get to the ideal wing; but if he must have shorter ones to suit his environment, he cannot afford to have them pointed, because such a shape would deprive him of some of his wing-area; therefore, in order to prevent the great waste of surface that the spilling of the air over a broad wing-tip occasions, he must have it split up into a number of small aerofoils of efficient shape.

Incidentally, this "shaping" of the wing is known in aeronautical circles as the aspect ratio. A long, narrow wing is said to have a high aspect ratio, and a short, broad one a low aspect ratio. The ratio is length divided by breadth, so if one wants the aspect ratio of a bird's wing, the mean breadth must be taken. Some aspect ratios are given in the table at the end of this paper.

Game-birds, such as the Partridge, Pheasant and Black-cock, are excellent examples of the type that cannot afford to have long, narrow wings. Instead, they have multi-slotted, broad, square-tipped ones. Black-cock and Pheasants actually have six slots in each wing, and proportionately these slots are among the longest of any that are found in British birds

IX. SLOTS IN FLAPPING FLIGHT.

Mr. Archibald Thorburn's excellent pictures of game-birds in flight and many others, have made everyone familiar with the appearance of their wings, with their many-fingered

Figure 31 shows the shape of the individual flight-

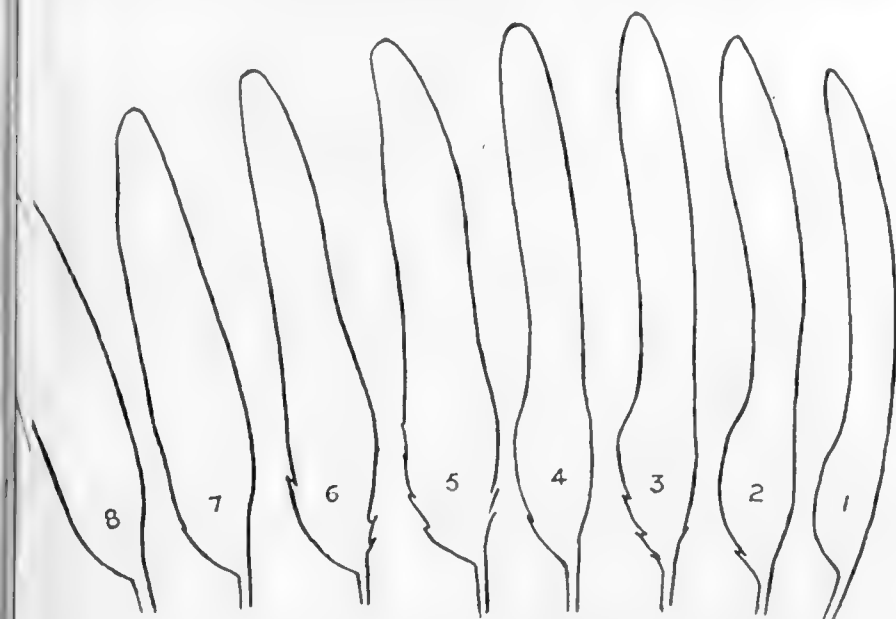


FIG. 31. The first eight flight-feathers of a Partridge.

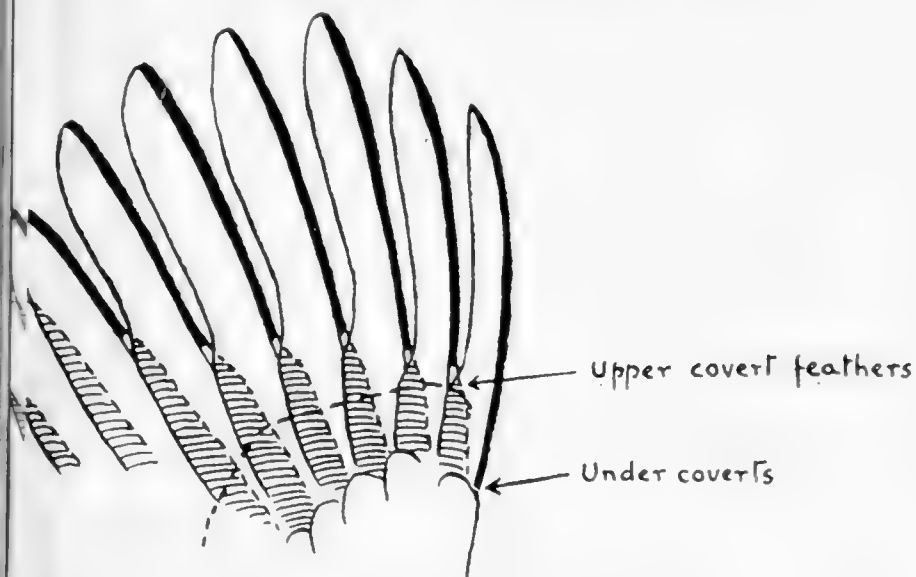


Fig. 32. Under-surface of a Partridge's right wing-tip. The unmarginated parts of the feathers are shaded where they overlap.
feathers of a Partridge's wing, and Figure 32 how they fit together and form the well-marked slots. One should not

be too sure that the action of this type of slot is quite the same as that described already, because the broad parts of the webs, inside the steps, are mostly so very short that they cannot have the same power to limit the separating of the feathers as have those of a Buzzard, for instance (Figure 4). This type of stepping-down is known to ornithologists as "basal emargination."

The extreme squareness of the wing fits in with the theory of wing-tip air spill; it is also possible that these slots may be of use to a Partridge for control when he is using a high angle of incidence in gliding flight; but they are so very long that one cannot help suspecting that their unusual shape is in some way connected with the characteristic fast-flapping flight of all game-birds. In the wing of a Partridge all six slots extend inwards for over one-third of the span of the wing, which may therefore be considered as consisting of two sections, the slotted and the solid. The question is "how does the slotted section behave under the conditions of the extremely rapid beat of these birds?"

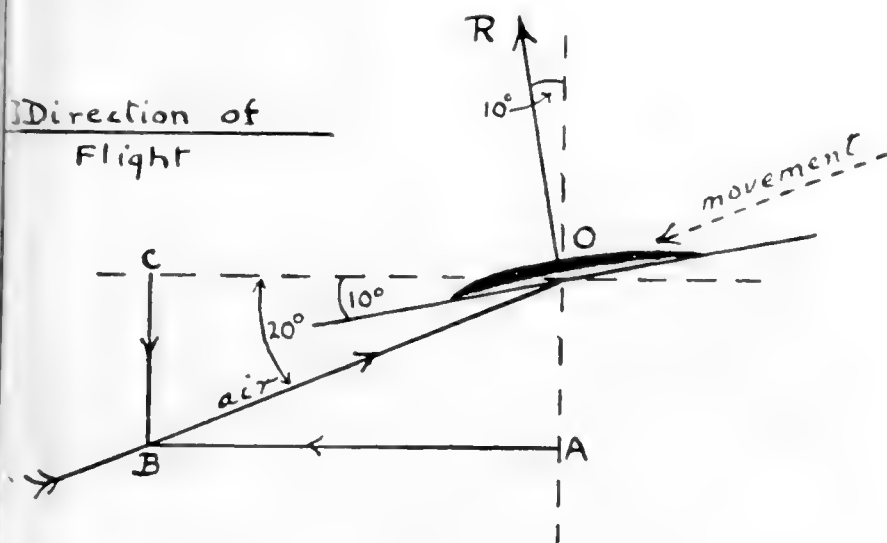
Before attempting to answer that question, it is necessary to run quickly through the action of a wing in simple, straight-forward, flapping flight. The most important thing to remember is that the force produced by the reaction of displaced air must act, for the most part, upwards to counteract gravity; but also in a slightly forward direction to overcome the comparatively weak force of the resistance of the air to the passage of the bird's body.

For the sake of argument, let us imagine a case in which the required direction of total reaction is 10° forward of the vertical. To obtain it, the blades of the wings must lie in a plane tilted 10° (approximately) forward of the horizontal. The inclination of that plane governs the direction in which the wings must move through the air, for the air-stream created by their movement must strike them at a suitable angle of incidence. Suppose that this angle is 10° ; then the wings must move forward through the air on a path inclined at 20° below the horizontal, as shown in Figure 33. This gradient path is a combination of the forward movement of the bird through the air and the downward movement of the wings themselves.

During this down-beat, the wings, having their bones much nearer the leading than the trailing edges, will automatically tend to turn their blades into line with the air-stream; so all that a bird has to do to apply the ten degrees

incidence, is to prevent his wings turning any further, when they have reached that incidence.

As much for the down-beat. With regard to the up-stroke, it is only necessary to say here that, as a rule, no lifting or driving force is produced; instead, the wings are relaxed and allowed to stream-line themselves so that they offer the minimum of resistance to the downward and backward gradient air-stream which they must encounter whilst rising up. The subject of the detailed working of wings in different phases and forms of up-strokes is such a tremendous one that it could, like the question of the down-beat, be made to fill a book by itself.



G. 33. The action of a section of wing in the down-beat.

OB.—The path of the section through the air.

BC and AB.—The downward and forward the movement of the section while it is travelling from O to B.

R.—The direction in which the Total Resultant Force acts.

The action of the slot-forming feathers in the up-stroke appears simply to be to join in with the others in effacing themselves as much as possible.

During a single down-beat in straightforward flapping flight, all points on a wing move forward about the same distance, but the distance they move down varies a great deal, from approximately nothing at the shoulder to a maximum at the tip. Therefore the wing-tip encounters a much steeper gradient air-stream than the wing-root, and to get the required incidence along the whole span, the wing itself must be twisted like the blade of a propeller. It seems probable that no incidence is given to the wing-root and only a small amount at points inside the wrist; otherwise

the reaction at those points would be directed backwards from the vertical—the last thing that is wanted. That being so, the twisting would be reduced, but still a good deal would remain. That it does remain is borne out by photographs (Figure 34), and one can see it, by watching closely, with the naked eye.



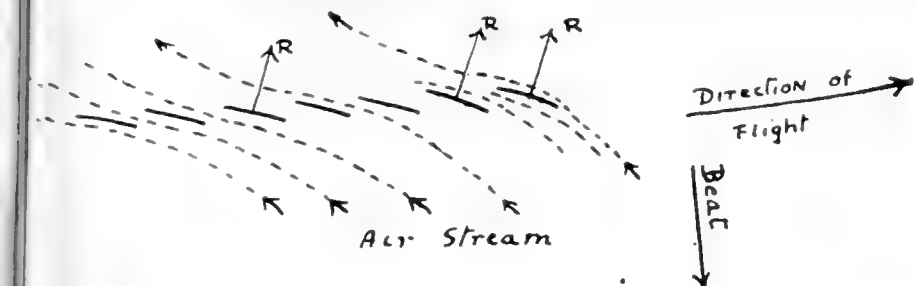
FIG. 34. The down-beat seen from behind showing the twist in the wings. Sketched from photographs. Left, fantail Pigeon ; right, Crane.

The quicker the down-beat, the steeper will be the gradient of the air-stream encountered by points situated near the tip of a wing, unless the forward speed is correspondingly increased. Game-birds, such as Partridges, usually do fly at great speeds, but for the time being consider one that has not got up full speed. With its exceptionally quick beat, one would expect its wings to be very much twisted in the down-beat, but in the few poor photographs which are obtainable of these birds in flight, there appears to be even less twisting of the wings than in slower-flapping birds ; so one is led to suspect that the action of the slots is to allow the feathers that form them to twist individually. This is almost the same action as that of the wing-tip slots of a soaring bird, the main difference being that practically the whole feather (except in the case of the rearmost slotted ones) is free to twist, because the unemarginated overlapping parts are so short.

It appears then that each separate feather works away by itself, just like a little wing of very high aspect-ratio (long and narrow), giving the bird the double advantage of saving wing-tip air-spill and weight ; for a wing that could compete with the extreme twisting that an unslotted Partridge's wing would require would have to be very strong indeed, and therefore heavy.

Figure 35 shows what a section of the wing taken half-way along the open slots might be expected to look like under these conditions. The pecked lines show the direction of the air-flow between the feathers, and the arrows show the

probable direction of the resultant force reacting on each feather. They remind one rather of a row of turbine blades.



35. Probable flow of air through the separated flight-feathers of a Partridge in the down-beat.

This action of the slots in the down-beat seems to be applicable to the flapping flight of all birds that have wing-slots, for the feathers can easily be seen to separate in the stroke; at any rate in such birds as Rooks and Crows. On careful watching it can even be seen in faster-flapping birds, such as Pigeons. It is quite probable that this "doing away with the need for the whole wing to twist" is one of the most important duties of wing-tip slots.

(To be concluded.)

NIGHT SOARING OF SWIFTS.

BY

P. W. MASSON.

IN 1926 I undertook a series of observations to test the validity of a belief of a friend that male Swifts (*Apus a. apus*) "spend one or two nights in the height of summer at a very high altitude. It must be set fair with the further outlook favourable also."

At that time I had been living for about twenty-five years in Belvedere, Kent, in a house under the eaves of which Swifts nested. Their numbers varied from year to year—from three to seven pairs. Under these circumstances it was really impossible not to observe the Swifts, and one's admiration for the wonderful quality of their flight grew, for, in a very real sense, the Swift has attained to perfection in flight.

During 1926 I had the good luck to witness ten or twelve ascents of Swifts on as many different evenings. Although no two ascents were exactly similar yet they agreed in detail more than they differed. Some considerable practice and experience are required to watch these ascents effectively. One must be provided with a pair of really good glasses of moderate power but with large lenses, owing to the late hour at which the observations must be made. Moreover, to get an unobstructed view, a platform on the roof of a house is the best station if that can be obtained within, say, 600 yards of the axis of the ascent. In 1926 I had such an observation platform. Here I had a body-rest, head-rest and arm-rest and a pair of good Ross prism glasses. The ascent of the Swifts is bewildering to follow—there seems to be no core of purpose or leader of the flock. Doubtless there must be a leader, but he is difficult to spot. Quite the best method is not to bother about the leader but to put the glasses on any likely bird and stick to it. The others are there and they will come into your field of vision higher up. If the trail is lost it can rarely be recovered. I made a practice of entering up my notes within ten minutes of leaving the platform.

To describe what I saw it will be best to give extracts from my notes of an ascent watched on July 14th, 1926, which was the best view I had during the season. The day had been fine and warm with a brisk easterly breeze, and the Swifts had been feeding fairly high up—say 700 feet. By 9 p.m. (summer time) they were all low down in extraordinary numbers. Round my station there were easily fifty birds, and at adjoining stations other considerable groups.

circus" parties were in vogue everywhere, and there was a good deal of brisk excitement, but not to the point of frenzy, though there were a few cases of hovering which may be regarded as such.

By 9.25 all the birds abruptly disappeared to their nests.

By 9.30 one or two reappeared and flew around without excitement. By 9.35 the number had increased to ten or twelve. These birds went up to perhaps 2,000 feet and then came right down again. Again they made their way up in a very loose formation, so much so that I had to abandon the group and stick to one bird.

The time was now 9.38 to 9.39. I kept my glasses rigidly fixed to one bird. He was climbing, and at first I found only four birds crossing my field of vision, but at about 9.41 my bird led me into the main army, a mass of nearly a hundred birds away to the north of my position. The sudden transition from one bird to a mass of a hundred was a very enjoyable surprise. The group was, on the whole, fairly compact.

Having a good prop for my head, I ventured to look over the glasses and not through them, and judged that the birds were up about half a mile. So they had not climbed very fast. There was a great deal of hovering. Looking now again through the glasses the hovering movement looked different. The wing vibration was extraordinarily rapid, but it was also accompanied by a slight lateral glide. This glide I could not see through the naked eye, but it was clear with the glasses. Between this time and 9.45 the birds had moved right over my head and climbed until they reached an estimated height of 1 to 1½ miles, at which height I lost the group. So steady was their location, and so firm were their body supports, that I was able to look over and through the glasses repeatedly, and yet always retain or regain the group in my field of vision. It is impossible to estimate heights through glasses—but it is very risky to look over and not always through. Finally, I picked up a star in my field. I looked over—no star was visible—through, it was again visible. I repeated this—yet held my birds. Finally, the birds faded out of sight.

Apart from the scientific value of such a wonderful climb—the emotional value seems even greater. It produces a rare thrill of wonder and delight.

At one moment one is surrounded with a swarm of birds so near to the earth that one could almost put out one's hand

and touch a bird. A very concrete reality. And to see these same birds mount and mount until they coalesce into a single group, the group merge into a small cloud—smaller and smaller, until it becomes a patch, and the patch a small constellation, yet visibly alive in its parts—and so small that it could apparently be covered by the human hand. All within the short time-interval of, say, ten minutes.

But to return to Mother Earth. How can we be sure that the birds do not come down again and roost on tree-tops and house-ridges for the night? They may do so, but in an experience of thirty years I have only once seen a Swift on a house-top and never on a tree. Still, during migration, it is reasonable to assume that the Swifts must rest on trees and house-tops—where else can they rest, having left their nests far behind?

But if they come down they do not re-enter their nests. Of that I am sure for physical reasons. A Swift often builds no nest. In this district it just occupies a ledge inside the roof, and access to all the nests is between a slate batten and a slate and between a slate batten and the top of a brick wall, and the approach to that is usually under an overhanging roof. The bird must, therefore, describe a curve down and up in approach, land on the wall under the eaves, dig his claws into the brick and crawl through the slit referred to. Under the eaves darkness sets in long before it does in the open sky, and to attempt such an entrance in inky blackness any bird would kill itself in the attempt.

Still there remains the question—do the birds come down and roost in the open? The only way to prove conclusively that they do not is to go up in an aeroplane and find them soaring in their aerial “park”—to cruise round the flock, and by aid of a searchlight get details of how the birds maintain their height in the “park” all night.

NOTES

CARRION-CROW BUILDING WITH WIRE.

On June 4th, 1930, half-way up the iron-work of a wind-pump at Preshute Down, near Marlborough, I found the nest of a Carrion-Crow (*Corvus c. corone*) containing three young. The nest had very few sticks in it, but was almost entirely built of pieces of wire and rabbit bones, a whole set of ribs being fixed in on one side. It was heavily lined with wool.

N. T. WALFORD.

BREEDING-HABITS OF THE JACKDAW.

On May 2nd, 1930, and subsequent days, with the help of two boys, I examined a large number of nests of the Jackdaw (*Colinus m. spermologus*) at Great Saling, Essex. The following points struck me as possibly worth recording.

The average number of eggs was very low: this may have been due to the very cold season or to the age of the birds, as they have been undisturbed for many years. One nest only contained six eggs; only four contained five, and a very large number only contained four or three; some birds were actually sitting on two. We revisited the nests a week later to make sure these were full clutches, as the number of eggs was so small and the eggs looked fresh on May 2nd, and I thought that the birds might not have finished laying.

One bird had two very well-muddled eggs not far down a very open hole in a broken branch of a huge elm; she did not lay any more; this was the only case of muddled eggs.

I think it must have been the same bird that I found with four similar eggs in 1926 (*B.B.*, Vol. XX., p. 23).

Many of the old nesting-holes had been destroyed by breakages of limbs and trees in the gales of the period November, 1929, to January, 1930. I was greatly interested to see that many Jackdaws had bored holes after the fashion of Woodpeckers, wider-mouthed but not so deep in proportion, in the rotten exposed wood of many of the breakages. Moreover, in many of these holes there was little or no nesting-material, the eggs in several cases being laid on the bare wood. At least two nests were constructed in a tall cypress, somewhat after the manner of a nest of a Wood-Pigeon (*Columba palumbus*), but with moss, grass and wool lining. In the first forks of an enormous cedar, nearly twenty feet in

circumference, at five feet from the ground, there was a great accumulation of *débris* of fallen twigs and old Rooks' nests, for there is a small rookery in the top. Jackdaws had burrowed into this pile of *débris* from various points and made nests there.

J. H. OWEN.

PIED FLYCATCHER EATING WORMS.

THE *Practical Handbook*, in describing the food of the Pied Flycatcher (*Muscicapa h. hypoleuca*), states as follows: "Said to have been seen searching for worms on ground, and also to take berries in autumn." On May 27th, 1930, in a Westmorland garden, while I was watching a pair of Pied Flycatchers which were occupying a nesting-box, the cock flew down on to the lawn not more than six feet from where I was sitting. He extracted a thin yellow worm about five inches in length from the ground, and after shaking it vigorously three or four times swallowed it whole, exactly as a Robin would have done.

This cannot, however, be a common occurrence, for in a long experience of these birds under the most favourable conditions, I have never seen it done before. A. ASTLEY.

[Mr. G. Bolam states that when insects are scarce the Pied Flycatcher does not hesitate to feed upon "worms and other creeping things", and has more than once seen it pounce on a worm and carry it away.—F.C.R.J.]

HEN BLACKBIRD INCUBATING THRUSH'S EGGS.

A SONG-THRUSH (*Turdus ph. clarkei*) was sitting on five eggs in my garden in Breconshire when an over-keen schoolboy killed it on the nest with an air-rifle. After being duly admonished, he came to me next morning to report that another bird was sitting. This turned out to be a hen Blackbird (*T. m. merula*) which in due time hatched out and reared the young Thrushes.

ALEC. T. WILSON.

HOOPOE IN ARGYLLSHIRE.

It may be of interest to record that on May 4th, 1930, I saw a Hoopoe (*Upupa epops*) near Oban.

I was driving a car and did not get a very good sight of the bird, which flew up from the grass at the side of the road in company with a Lapwing. Although I saw only the back view of the bird, I do not think I can have made any mistake as I lived in Egypt for twenty-four years and am perfectly familiar with the species. The black and white stripes on

the wings and the buff-chestnut body made the species easily distinguishable from anything else in this country.

G. H. MALCOLM.

CUCKOO REMOVING ANOTHER CUCKOO'S EGG FROM A NEST AND ITS SEQUEL.

PAIR of Pied Wagtails (*Motacilla a. yarrellii*) had built their nest in the hole of an apple tree in close vicinity to my house. On the evening of May 19th, 1930, the nest was without eggs and apparently unfinished, so I did not trouble to look into it on the following day. Two female Cuckoos (*Cuculus canorus*) that I had heard "babbling" at one time in my grounds suggested that this nest might be selected by one of them. On May 21st, at about 5.35 p.m. (summer time), I noticed a hen Cuckoo evidently interested in the site, and with my wife and others we watched her movements; at first within about twenty yards distance and then, so as not to interfere with her evident intentions, we withdrew to about forty yards away, where she still remained in full view, and we had the help of our binoculars in addition. The Wagtails were not in evidence during the visit. From her actions the nest had evidently already been located, and after preliminary movements around about, within a few feet of the site, she entered the nesting-hole at 5.50 p.m. The nest was rather deeply recessed, but her head and tail remained visible. After a little shuffling about, her head appeared fully in view and apparently something light in weight was ejected from the hole before she finally settled down. Twelve minutes later she left the nest and flew to an adjoining apple tree and remained quiescent for about five minutes, evidently recovering from her efforts of laying. Whilst perched there, Robin flew up to her and the greater part of the time remained in her company within about a foot distant, and I might add that young Cuckoos had been reared by Robins in the immediate vicinity in previous years. Before looking into the nest I examined the ground below the tree for the ejected article and was surprised to find it was the broken eggshell of a Cuckoo, but no trace of any of its contents. Within the nest was the still warm egg of the Cuckoo, but no eggs of the Wagtail were then present.

Although the Cuckoos' eggs were of similar types (possibly related birds) the one was of a more greenish tinge and distinctive, and I do not think the same female Cuckoo has ever been recorded laying twice in the same nest. No trace of

the contents of the first egg could be detected in or about the nest, and no doubt, as is usual, it had been cleanly swallowed; at times, by personal observation, I know this removal takes place subsequent to the laying. I am inclined to think that the other Cuckoo had laid the day previously, as an artist had been at work within a few feet of the nest sketching the house during that afternoon and up to the time the second Cuckoo first appeared. On May 23rd two eggs of the would-be fosterer had been laid in company with that of the egg of the Cuckoo, and on May 27th I found a usual full clutch of five eggs had been laid by the Wagtail, which is in favour of her not having commenced laying until after the laying of the second Cuckoo. The egg of the Cuckoo had disappeared, but the dried yolk of a broken egg adhering to several others was in evidence. This fact raises in one's mind the query: Did the Wagtail remember the premature laying in her nest and subsequently distinguish the intruder's egg for removal, as is undoubtedly done by some unusual foster-parents? With these facts in mind, it is interesting to anticipate the double tragedy the young Wagtails will have escaped.

J. S. ELLIOTT.

GARGANEY BREEDING IN SOMERSETSHIRE.

ON May 20th, 1930, while hunting some marshes in Somerset, I flushed a Garganey (*Anas querquedula*) from a nest with eleven eggs, which had been incubated for about a week.

P. M. MEESON.

THE WINTER STATUS OF THE BASS ROCK GANNETS.

IT is well known that the Bass Rock Gannets (*Sula bassana*) are absent from that breeding station and its vicinity during the period roughly from November to February.

From 1912 to 1918 I was in command of various destroyers stationed in the Firth of Forth, and whilst on submarine patrol had many and frequent opportunities of observing the Gannets on Bass Rock at all seasons of the year. I therefore determined to make notes of all Gannets seen in the North Sea during the winter months and accordingly gave orders to my "officer of the watch" to report all Gannets sighted when out on patrol.

The following observations were obtained:—

February 10th, 1916.—Eight Gannets off May Island. Considerable numbers were seen daily after this until the middle of November, when the majority left for "somewhere."

November 20th-25th, 1916.—A few Gannets seen close in to Inchkeith and also some on the Dogger Bank, mostly this year's immature plumage).

December 1st, 1916.—Two old birds seen off May Island.

December 6th, 1916.—Three old birds off St. Abb's Head. One young bird (immature) off Inchkeith.

December 22nd-26th, 1916.—Several Gannets observed round Dogger Bank.

December, 1916.—Only one Gannet seen off Kinnaird Head as against the usual large numbers in other months.

January 14th-16th, 1917.—One Gannet 200' east of Aberdeen. Three Gannets off Bass Rock. One Gannet off May Island. One Gannet off Inchkeith.

February 15th, 1917.—Several Gannets between Inchkeith and May Island.

At 5.0 p.m. we passed through some 200-250 Gannets settled on the water some three miles out from May Island. They appeared very tired as if they had only just returned from a long migration flight, and only flapped out of our way to settle again on the water some 200 yards away, as the ship steamed slowly through them. Considerable numbers were seen after this date.

Unfortunately, I have no records for 1914 or 1918, but I am of opinion that the winter 1916-1917 was a fair average for the other three years. Each year I was on patrol on an average of eighteen days each month, covering a good many thousand miles between the Firth of Forth, Bass Rock, Dogger Bank to the south, Aberdeen and Kinnaird Head to the north, and across to Norway to eastward.

The number of Gannets sighted is a very small percentage of the birds known to have bred on the Bass Rock.

Where do the others (at least 90 per cent.) go to for December and January?

GEOFFREY CORLETT.

TWENTY-YEAR-OLD RINGED BLACK-HEADED GULL.

ON May 26th, 1930, Mr. Walter Marchant wrote me that a black-headed Gull (*Larus r. ridibundus*) had been picked up dead at Ravenglass, Cumberland. The bird had been dead about a fortnight when found. It carried ring number 870, which was put on it when a nestling at Ravenglass on June 13th, 1910, in the second year of our ringing scheme, by Messrs. H. W. Robinson and F. W. Smalley.

In *British Birds*, Vol. XX., pp. 71-3, in reviewing a paper by Major S. S. Flower, I gave some examples of the duration of life in ringed birds. The oldest was a Heron (*Ardea cinerea*) of nearly 16 years. The oldest Gull was 13 years. Since the review mentioned we have had the following records:—

- BLACKBIRD (*Turdus merula*).—10 years (*B.B.*, Vol. XXIII., p. 112).
 TUFTED DUCK (*Nyroca fuligula*).—14 years (*B.B.*, Vol. XXIII., p. 19).
 CORMORANT (*Phalacrocorax c. carbo*).—14 years (*B.B.*, Vol. XXII., p. 184).
 SHAG (*Phalacrocorax a. aristotelis*).—14 years (*B.B.*, Vol. XXIII., p. 120).
 LAPWING (*Vanellus vanellus*).—12 and 11 years (*B.B.*, Vol. XXI., p. 88; Vol. XXII., p. 186).
 WOODCOCK (*Scolopax r. rusticola*).—12 years (*B.B.*, Vol. XX., p. 249).

A Golden Eagle which was recently taken in Germany had been ringed for twenty years, but, except for this, the Black-headed Gull recorded above is the oldest ringed bird of any species of which I have a record, and it is interesting to know that it was found in the same colony in which it was hatched twenty years before. H. F. WITHERBY.

SPOTTED CRAKE IN HERTFORDSHIRE.

A SPOTTED CRAKE (*Porzana porzana*) was picked up dead by me on April 9th, 1930, under some telegraph wires near the River Lea at Harpenden. The bird proved to be a male and the skin has been preserved. A. P. MEIKLEJOHN.

BREEDING OF THE SPOTTED CRAKE IN SOMERSETSHIRE.

ON May 20th, 1930, accompanied by a young marshman and his dog, I was hunting some Somerset marshes when my companion showed me what he thought was a Landrail's nest which he had found a few days previously, when it contained about a dozen eggs. The nest now contained three chipped eggs nearly cold and a very weak chick. It was an undoubted nest of the Spotted Crake (*Porzana porzana*). About two hours later, while searching some dense cover, my companion trod on a bird which uttered a sharp squeak, and in trying to find it we discovered another nest of a Spotted Crake containing thirteen eggs incubated about fourteen days. While examining this, the dog most unfortunately caught and killed the old bird at our feet. Later on, returning to the first nest, we found that the chick was dead and the eggs quite cold. I am having both birds preserved.

Both nests were made with dead reeds and sedges and were built on the ground, no hollow having been formed as in the case of the Landrail. P. M. MEESON.

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NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U.

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SAFETY DEVICES IN WINGS OF BIRDS.

BY

LIEUT. R. R. GRAHAM, R.N., M.B.O.U.

(Continued)

X. THE WRIST-SLOT.

In addition to the wing-tip slots already described, all birds are the fortunate possessors of another anti-stalling device which is even more like the Handley-Page gear. This is the alula or bastard wing. It consists of one main feather overlaid by two or more auxiliary ones which give it strength and thickness. These all spring from a small limb which corresponds in the anatomy of a bird to the thumb of the human hand. In Figure 36 a wing is shown with all the feathers removed except those of the bastard wing and the primaries and secondaries. The relationship to a thumb is unmistakable.

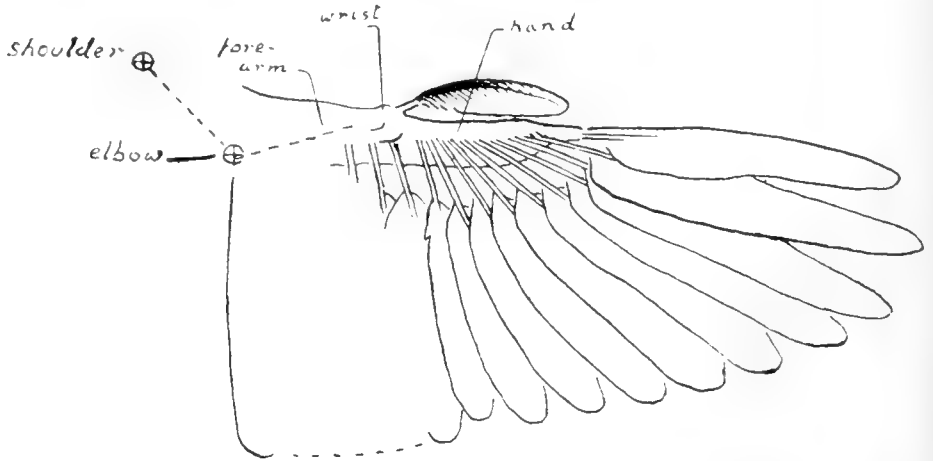


FIG. 36. Under-surface of the left wing of a Dove, with the covert feathers removed.

This limb has a set of nerves and muscles all of its own. Headley, in *The Flight of Birds* (1912), remarks that it has more muscles than one would expect to be at the service of so insignificant a piece of machinery. Nowadays (1930) we know that it is not so insignificant, except perhaps in size.

Shufeldt, in his *Myology of the Raven*, says that the muscles and tendons that serve the bastard wing are so arranged that when the main wing is fully spread the feathers of this tiny winglet are also spread so that they present the greatest amount of superficial area to the atmosphere, that is, they are ready for action.

When the main wing is at a fairly small angle of incidence, and there is no risk of a stall, the bastard wing serves no active purpose. It is so shaped that it forms part of the leading edge and therefore, with that part of the wing, is subject to pressure from the air-stream, as a glance at Figure 1 will show. This pressure keeps it in position, and it does nothing more than fill in the slight "re-entrant curve" in the leading edge of the main wing which can be seen in Figure 36.

When a wing is at normal angles of incidence, the area of pressure on the leading-edge covers the whole breadth of the bastard wing, but as the incidence is increased the area of suction moves forward and sucks the bastard wing upwards.

This may seem to be rather an astonishing statement, but, bearing in mind that the air which passes over the top of a wing cannot exert any upward suction until it has passed over the summit of the curve (or camber), one can see from a comparison of Figures 1 and 2 how the movement comes about.

In the wing which lies at the smaller angle of incidence, the summit of the curve (with respect to the horizontal) is fairly far back and the upward suction does not begin till the air has passed that point, but in the wing which is at the greater angle the summit of the curve (and consequently the area of suction) is much further forward. Thus, as the incidence of a wing increases, the region of suction extends forwards until it eventually reaches the bastard wing and lifts it. It can be so lifted without difficulty, for its joint is easily flexed in the upward direction. In fact, it will answer to the "fan test" described on page 17 even better than wing-tip slots do.

The upward force which the suction exerts may perhaps be added to by muscular action in accordance with Headley's observation, and may also be augmented by that part of the air-stream which passes under the leading edge of the main

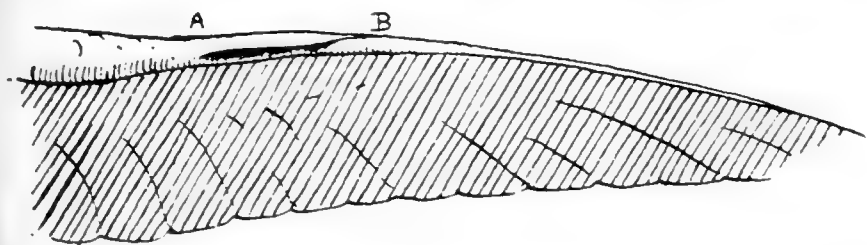


FIG. 37. Left wing of a Woodcock seen from below and in front, showing the bastard wing in the "slot-closed" position.
AB.=Total length of the bastard wing.

wing, for there is a little pocket formed between the front of the bastard wing and the "re-entrant curve" mentioned above into which air must press with increasing force as the angle of incidence gets greater. In Figure 37 this pocket is shaded black. But one thing seems certain, and that is that the opening of the wrist-slot is mainly automatic and that it is brought about in the same way as the opening of a Handley-Page slot.

Once the initial upward movement has started, a stream of air passes between the main and bastard wings and assists the suction in its work by pressure from beneath. Having formed part of the curved-down leading edge of the main wing, the bastard wing, when acting on its own, finds itself to have a considerably smaller angle of incidence than its

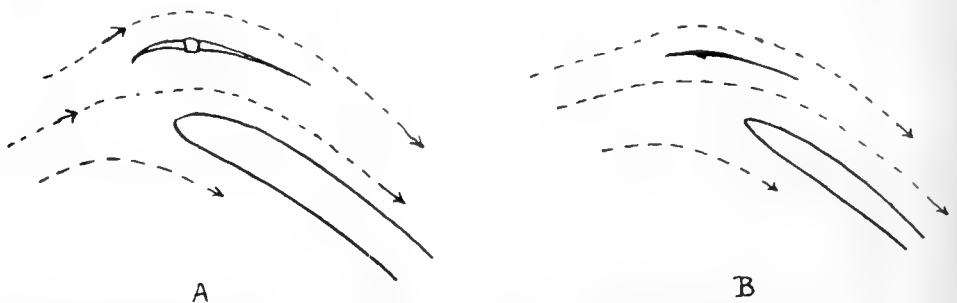


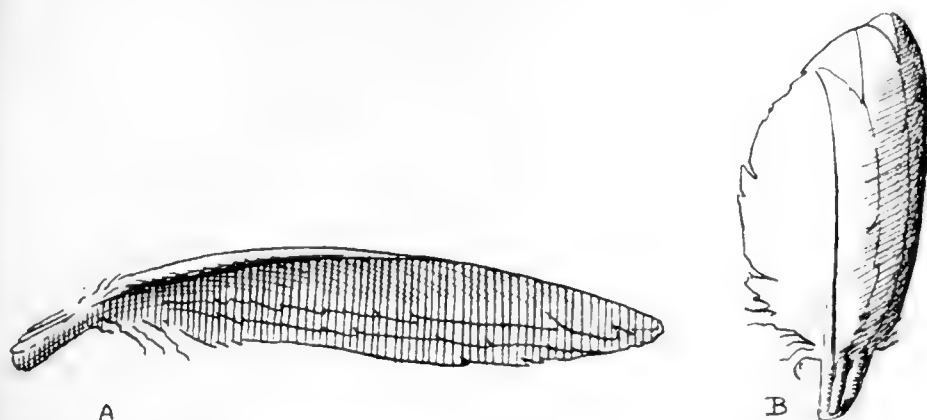
FIG. 38. Probable flow of the air-stream through the wrist-slot of a Blackcock, A. near the root of the bastard wing and B. near the tip.

parent (see Figure 38), therefore it remains effective and unstalled when the main wing has passed the stalling angle.

Another result of its smaller incidence is that the force reacting approximately at right angles to its surface is directed more forward than that on the main wing. Consequently, it is dragged forward as well as upward, like the separated feathers which form wing-tip slots. Further, the angle at which the pivot of the joint is set allows of motion more easily in that direction than in any other. The upward and forward displacement can be clearly seen in Figure 6. The right wing of the Marsh-Harrier provides a plan view which shows the forward movement, and the left wing an elevation which shows the upward movement.

Nearly all bastard wings are curved down not only from front to back, but also from root to tip, so that when they are in the open position and the curve has been slightly reduced by the upward force of air-reaction, they lie nearly parallel with the leading edge of the main wing and are to all intents and purposes in the same position with regard to it as the

auxiliary aerofoil of an aeroplane wing which is fitted with the Handley-Page device ; that is, displaced to a position parallel with, above, and in front, of it.



Bastard wing of a Blackcock.

A. Seen from below and in front.

B. From above, slightly foreshortened.

Their action when in that position must be very much the same as that of the separated tip of the first flight-feather of a single-slot wing described on page 14, in other words it acts as an automatic safety device to prevent stalling when a large angle of incidence has to be used.

The action of the closing of the slot formed by the bastard wing must be just the reverse of the opening action. Put shortly, it may be said that as the incidence of the main wing diminishes towards the angle at which the assistance of an auxiliary to prevent stalling is no longer required, the incidence of the bastard wing, being already less than that of the main wing, approaches the angle of "no lift," and finally it experiences a downward reaction which forces it down into its "stowed position" in the re-entrant curve.

It is possible that the tiny "flexor" muscle (*flexor brevis pollicis*), which is so arranged that it pulls downwards on the bastard wing, assists air-pressure in this process, and it is also possible that the "extensor" muscles, which are designed to pull upwards on it, come into play in the opening process more than has been suggested ; but the most likely duty of these muscles is to damp down the movements of the bastard wing and "steady" it in the closed or open position, just as the springs of the Handley-Page slotted wing device do. Shufeldt says of the "flexor" muscle that it is sufficiently powerful to retain the bastard wing in the closed position when the wing is folded.

The considerations which govern the length of the bastard wing in different types of birds form a most interesting study. Like the wing-tip slot, this other form seems to be influenced chiefly by the aspect ratio, for birds with long, narrow, pointed wings, like the sea-birds, and such birds as the Golden Plover

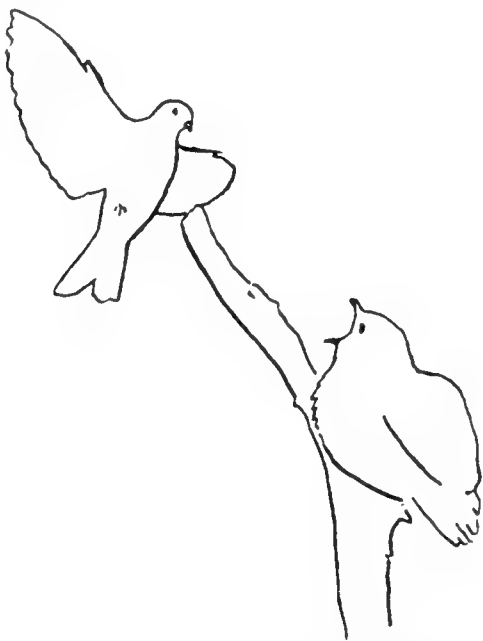


FIG. 40. Meadow-Pipit about to alight to feed a young Cuckoo. The wrist-slots are open. (Sketched from a photograph.)

and Woodcock, have smaller bastard wings than the short-winged types, such as the game-birds; though, again, such matters as wing-loading, size of bird, speed of flap, span-loading (weight carried per unit of length between wing-tips)* and habits of living may have a certain influence as well. Figure 40 and the left-hand bird in Figure 41 show examples of the bastard wing in action, and the right-hand bird shows the appearance of a wing when the slot is closed.

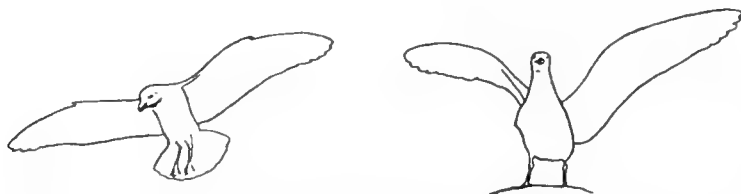


FIG. 41. Great Black-backed Gull; on left with the wrist-slots open and on the right, closed. (Sketched from photographs.)

* Data on these matters will be found on page 64.

It would be rash to come to any conclusions as to the lessons that are to be learned from the anti-stalling devices of birds without careful considerations of the influence that flapping flight may have upon their design; but two things seem to stand out clearly: (1) that the ideal glider is one that has great span, high aspect ratio, and pointed wing-tips, like an Albatross, and (2) that such a glider would probably be but little improved by the presence of any form of anti-stalling device, either on the main wing or on the control surfaces. But if practical considerations, such as structure-weight, housing and handiness for operation, dictate a smaller span, then it is worth while considering the fitting of some form of aid to control and lift. As all aeroplanes are, in effect, gliders with motors in the place of gravity to give them forward movement, the same thing should apply to them as well.

SUMMARY.

The connections between the ways of birds in the air, their size, the shape and loading of their wings, the presence or absence of slots, and, when present, their development, are so intricate that many years of investigation would be required before really satisfactory conclusions could be reached. The surface of the subject has only been scratched in this paper, but it is hoped that the scratches will have indicated the amazing width of this field for research and the possibility of the riches that may be found in it. For what they are worth, the observations, theories and tentative conclusions which have been mentioned are summarized below.

1. Wing-tip slots are formed by the gaps left between the remargined tips of the flight-feathers of a fully-spread wing.
2. They vary in number, if present at all, from one to eight, and in size from nearly half the length of a wing to mere vestiges.
3. Their presence appears to depend primarily on the proportionate length of the wings of a bird and on the shape of their tips. Short wings, with rounded or square tips, have the greatest number and the highest development of these slots. Long, narrow, pointed wings have none.
4. By doing away with mutual support between feathers, slots form an automatic anti-stalling device, which appears to work in somewhat the same way as the Handley-Page slotted aeroplane wing.
5. Wing-tip slots increase lateral control at low air-speeds.

6. They reduce the losses in efficiency of a wing that are due to the spilling of air over the tip.

7. They reduce the amount of twisting that is required in flapping flight to align the outer parts of a wing reasonably near the gradient of the air-stream, which is much steeper at the tip than near the shoulder.

8. The final spreading of a wing, which opens the slots, appears to be done automatically, air-reaction dragging the separated feathers forward when the incidence is sufficiently high.

9. Over-spreading of a wing, to the extent that gaps would appear between the feathers on the body side of the inner extremities of the slots, is prevented by means of special friction surfaces on the overlapping parts of the feathers.

10. The wings of all birds found in the British Isles possess a second anti-stalling device situated just outside the wrist-joint, in the shape of the bastard wing. Its size varies in different species from about one-tenth of the length of the wing to about three-tenths. In form, action, and effect, it more closely resembles the Handley-Page auxiliary aerofoil than wing-tip slots do.

SOME INTERESTING DATA.

	Slot Factor.	Bastard- Wing Factor.	lbs. per sq. ft. Wing Loading.	Oz. per ft. Span Loading.	lbs. Weight.	Aspect. Ratio.
Pheasant (<i>P. colchicus</i>) ...	2.8	0.27	3.0	22.0	3.0	1.7
Blackcock (<i>L. tetrax</i>) ...	2.1	0.24	2.5	13.0	2.6	2.17
Capercaillie (<i>T. urogallus</i>) ...	1.9	0.21	3.0	28.0	7.0	2.85
Willow-Grouse (<i>L. lagopus</i>) ...	1.66	0.22	2.9	13.1	1.8	2.6
Partridge (<i>P. perdix</i>) ...	1.66	0.22	2.15	17.0	0.7	2.26
Griffon Vulture (<i>G. fulvus</i>) ...	1.4	0.14	1.85	31.0	16.2	2.7
Red-legged Partridge (<i>A. rufa</i>) ...	1.14	0.3	2.5	10.0	1.0	2.17
Little Bustard (<i>O. tetrax</i>) ...	1.2	0.15	1.56	7.7	1.37	2.95
Hoopoe (<i>U. epops</i>) ...	1.0	0.16	0.55	1.7	0.16	2.0
Buzzard (<i>B. buteo</i>) ...	0.91	0.17	0.62	4.8	1.5	2.84
Wheatear (<i>Æ. cenanthe</i>) ...	0.84	0.15	0.36	0.86	0.045	2.3
Blackbird (<i>T. merula</i>) ...	0.75	0.16	0.82	5.6	0.19	2.1
Song-Thrush (<i>T. philomelos</i>) ...	0.55	0.17	0.77	2.0	0.14	2.4
Goldfinch (<i>C. carduelis</i>) ...	0.54	0.15	0.36	0.68	0.027	2.35
Sky-Lark (<i>A. arvensis</i>) ...	0.49	0.14	0.37	0.9	0.055	2.3
Pied Wagtail (<i>M. a. yarrellii</i>) ...	0.47	0.18	0.41	0.85	0.047	2.37
House-Sparrow (<i>P. domesticus</i>) ...	0.45	0.16	0.43	1.1	0.05	2.5
Lapwing (<i>V. vanellus</i>) ...	0.39	0.14	0.57	2.9	0.4	2.9
Nightjar (<i>C. europæus</i>) ...	0.36	0.16	0.4	1.3	0.14	4.6
Scops Owl (<i>O. scops</i>) ...	0.31	0.2	0.64	2.4	0.26	2.43
Kestrel (<i>F. tinnunculus</i>) ...	0.29	0.19	1.1	3.7	0.48	3.26
Starling (<i>S. vulgaris</i>) ...	0.21	0.16	0.76	1.9	0.16	2.9
Quail (<i>C. coturnix</i>) ...	0.2	0.2	1.7	3.2	0.25	2.8
Wryneck (<i>I. torquilla</i>) ...	0.18	0.12	0.7	1.37	0.09	2.75
Night-Heron (<i>N. nycticorax</i>) ...	0.18	0.21	0.88	11.0	2.25	2.6
Ruddy Sheld-Duck (<i>C. ferruginea</i>) ...	0.12	0.17	2.0	7.8	1.38	3.6
Great Crested Grebe (<i>P. cristatus</i>) ...	0.11	0.15	3.5	9.8	1.5	4.2
Short-eared Owl (<i>A. flammeus</i>) ...	0.1	0.13	0.76	4.8	1.0	3.3
Woodcock (<i>S. rusticola</i>) ...	0.0	0.11	1.25	6.0	0.75	3.0
Golden Plover (<i>C. apricarius</i>) ...	0.0	0.12	1.2	2.1	0.19	3.6
Black-headed Gull (<i>L. ridibundus</i>) ...	0.0	0.12	0.62	2.47	0.44	4.73
Swallow (<i>H. rustica</i>) ...	0.0	0.13	0.34	0.8	0.05	3.7

COLUMN 1.—Gives the total length of slot that opens between separating feathers in one wing, as a fraction of the length of the wing measured from tip to body. The length of any one slot has been taken to be the length of the front margin of the slot when it is fully open.

COLUMN 2.—Gives the length of the bastard-wing as a fraction of the length of the wing. As it is difficult to determine how much of this winglet is actually operative, owing to some of it being blanked off by small feathers near the root, the measurement has, in all cases, been taken by sliding a ruler under it and pressing in towards the wing-root as far as possible.

COLUMN 3.—For the purpose of obtaining the wing loading, the area used is the area of the greatest projection of the fully-spread wings, cut off at the elbow joints. This point has been used rather than the junction of wing and body, because the feathers that spring from the upper arm of a bird do not seem to be designed to produce any lift. They appear to serve the purpose of reducing the air-resistance of the limb by giving it a stream-line shape. They swivel easily either upwards or downwards, instead of resisting an upward pressure as the secondary feathers do.

COLUMN 4.—Gives the weight in ounces carried per foot span of wing. These units were chosen as giving convenient figures.

COLUMN 6.—Gives the ratio of fineness (or aspect ratio) of the wings, arrived at by dividing the length of a wing by its mean breadth. The length is taken as the distance between wing-tip and body, and the breadth by means of five measurements, of which the result is the average. These are at the elbow joint, one-quarter, one-half, and three-quarters of the distance between it and the wing-tip and then, in order to give the wing-tip its full share of importance, the fifth measurement is taken at one-eighth of the distance in from the tip to the elbow.

The figures given above are only intended to give a rough idea of how the data vary with different types of birds and different methods of flying. They should not be considered as accurate because they do not represent averages taken from a large number of birds, and because accuracy in measurement of these things is well-nigh impossible.

FIELD-NOTES ON THE SHELD-DUCK.

BY

CAPTAIN F. W. DEWHURST, R.M.

THE following notes on the Sheld-Duck (*Tadorna tadorna*) were obtained during the last five years on a tidal branch of the River Tamar, Cornwall.

MIGRATION.—A few pairs remain in home waters all the year round. In the middle of January I only counted two pairs in the river, but on February 1st a flock of about 150 had arrived on the Lower Flats.

From the end of April until September, 1929, a flock of about 70–80 birds inhabited the Upper Flats, some two miles up river. I do not know when they left, as my boat was hauled up. These birds were all adult males, either unmated or birds in their first year.

TERRITORY.—Early in March the various pairs begin to take up their breeding areas. These areas are well defined and no trespassing is allowed. If a stranger flies over he is threatened by notes, but if he alights he is immediately attacked and driven off by the male. The same areas are occupied each year. If undisturbed, the nest can be looked for within 20–30 yards of the same place each year.

One creek about 1,000 yards long holds four breeding pairs each year. Another creek about the same length, but narrower, holds three pairs.

COURTSHIP.—In the early mornings of mid-April, single birds constantly fly up and down the river and creeks, much to the annoyance of the mated males with territory. I presume these are bachelors in search of unmated females.

The mating season, I consider, is during the latter half of April. Every morning between 5.30 and 6.0 a.m., for about a fortnight, round about 25th April in 1927, most of the breeding birds in the district used to congregate in a field 50 yards from the creek. One morning I counted fourteen pairs, although the creek only held four nesting pairs. Much bowing and bobbing and other displays were gone through. I have no record of the actual sounds they made, but sounds there were, I remember. I never saw actual mating.

NESTING-SITES.—Both birds become very excited when their nesting area is approached by man. They fly overhead, to and fro, giving the danger call, but they will not attack one. The male has various calls: (a) That used for the

attack; (b) that used for danger about; (c) that used for sudden alarm; (d) that used for love talk, courtship.

Rabbit holes on the banks are the most common nesting-places. They are generally near the top of the bank, 6-8 feet up. The nest is usually 4-5 feet from the entrance. Very often a bolt-hole also connects with the nest. In 1928 I found a nest in a wood on a hill, a good half-mile inland. This nest was built in a clearing on the level ground under deep bracken. The bird deserted while still laying, so I watched the eggs out under a hen.

In May, 1929, a pair were noticed, four mornings in succession, looking for a nesting-site on a steep hillside covered with bracken about a quarter-mile from the end of the creek.

In 1927, I came across a young brood one morning about three-quarters of a mile inland making for the head of the creek. In my opinion, these inland nesting-places are only used when no other areas on the creeks are suitable or available.

I have mentioned before that in mid-April single birds constantly fly up and down the creek, but occasionally a pair of birds are seen flying together. If this happened early in May one could be pretty certain that they were mated, but had no nesting area. If one watched them flying up and down the creek and out into the river, one could eventually locate where they settled inland. I found two or three nests like this.

THE NEST.—The eggs are laid daily, early in the morning before 7.0 a.m. Clutches seem to hold eight to eleven eggs.

My earliest full clutch—ten eggs—was on May 1st, 1927. Down is not plucked into the nest until three to four eggs are laid. When the clutch is nearing completion the eggs are left covered all day. When sitting, the female comes off the nest to feed twice a day, but not during the last forty-eight hours before hatching, generally on the full or an ebbing tide.

The Sheld-Duck is single brooded. The male takes no part in the incubation, but he always remains on guard within fifty yards of the nest. If he can warn his mate in time she will come off her nest, the eggs being always carefully covered over first, otherwise she sits fast. I have frequently caught females on their nests. Most birds are sitting in the latter half of May.

In 1928, two nests which I tested—by opening—on May 23rd and 28th contained hard set eggs which I judged

to be about half-incubated. Hatching eggs under a hen, I made the incubation-period twenty-three days, the eggs never got cold : and twenty-seven days from a deserted nest. The eggs will not hatch out well if left dry. They must be kept well moistened. I found the best home-made nest was : (a) in the open, if I had a hen sitting out ; (b) if indoors, on a large sod of turf well-soaked, a layer of straw and a lining of hay. During the week before hatching the eggs should be immersed daily in tepid water. The hen must be made to come off daily to feed.

YOUNG.—When hatched under a hen the young thrived well on oyster-grit, fish-meal, fish, boiled cabbage, flaked maize, barley meal and meat. Their water was salted. When feeding they continually rushed from the food bowl to the water bowl to clean their mouths. Also, a piece of meat or cabbage was nearly always taken to the water and eaten in the water.

I tried putting young wild-hatched Sheld-ducklings with young Khaki Campbell ducklings under a hen and under a duck, but the former were too wild and got lost by running off and hiding themselves. Neither would the various broods intermix. The only safe method was to keep them in a hut or wired-in enclosure, however they were hatched. Naturally, those hatched under a hen thrived the best. It was amazing to watch the different rates of growth in the same brood. The weaklings eventually died, especially during the critical period, *i.e.*, when losing their down and getting their feather-quills through—about five to seven weeks' old. They get their full plumage early in September.

It soon becomes evident which are the young males. Their bodies appeared longer, especially at the tail end. Also the quills of the tail-feathers are stronger, larger and darker and stick out more.

The red knob on the beak of the male does not appear till they are in full plumage.

When the tide is out, and a family party is suddenly approached on the mud flats, they scatter at once for the banks and conceal themselves, crawling up any available holes or under logs. But, for preference, the female takes them to water, where they swim away first and dive as they are approached. The male flies off, circling round, and generally settles on the water again about 200 yards off. The female feigns injury and flaps along the water, continually calling and almost whistling to her brood.

If the brood is approached from afar, the female swims very fast and the young follow at great speed. Skimming almost on the top of the water, flapping their tiny wings, they look like Moorhens rising on the water or a speed-boat going along.

The young whistle a lot when in danger. The old birds do not dive, but will feed with their heads and necks under water. The young dive as soon as they get to water—anyhow, on the second day after hatching. They appear to jump up and go under head first with quite a splash. When small, they remain under twenty to thirty seconds, swimming upward all the time for 20–30 feet. The length of the dive depends a good deal on their age. The mortality among the young is very high. If four to six survive till September consider it a good brood. Out of four nests hatched out at the creek only one brood of five was seen on October 6th, 1929.

PLUMAGE.—At about six weeks old they lose their baby down and begin to get feather-quills and a full covering of feathers early in September.

Although the drake takes no part in brooding, it will be observed that he remains in close vicinity to the female, nest and ducklings throughout the breeding-season.

BIRDS RINGED IN ICELAND AND RECOVERED IN THE BRITISH ISLANDS.

BY

H. F. WITHERBY.

MR. P. SKOVGAARD, whose ringing scheme in Denmark is well known to our readers, has published (*Danske Fugle*, 1930, pp. 57-73) a list of recoveries of birds ringed in Iceland. This has also appeared in a less detailed form, with notes by Mr. E. M. Nicholson, in *Discovery*, July, 1930, pp. 220-4. I give here a list of those birds reported from the British Islands taken from *Danske Fugle*, with a few necessary corrections of mis-spelt place-names and in one or two cases slight differences of date in cases reported direct to me.

These records have the greatest interest to British ornithologists, and we are thankful that Mr. Skovgaard has at last published them. For some years he has refused to give the ringing details of these birds. Many have been reported to me, and I have been unable to tell the reporter where or when they were ringed. This is a most unfortunate and short-sighted policy, as it is obvious that to induce people to report the recovery of ringed birds one must interest them in the subject. Moreover, it is a distinct handicap to science to leave such records unpublished for three or four years, and it is to be hoped that Mr. Skovgaard will not continue to pursue so misguided a policy.

All the birds in the following list were ringed in Iceland in the districts named.

No.	Place and Date Ringed.	Place and Date Recovered.
WHITE WAGTAIL (<i>Motacilla a. alba</i>).		
19221	Myrasysla, 16.6.28.	Rockall, 5.9.28.
GADWALL (<i>Anas strepera</i>).		
V.3539	Husavik, 10.7.27.	Rye (Sussex), 26.10.27.
V.3723	Husavik, 23.7.28	L. Glore (Westmeath), 12.2.30 (reported as Wigeon).
V.3724	Husavik, 23.7.28.	Corrandulla, near Headford (Galway), 27.1.29.
TEAL (<i>Anas c. crecca</i>).		
V.4421	Saudarkrok, 24.8.29	Near Stranraer (Wigtown) 3.12.29.
K.8032	Husavik, 2.8.28.	Northumberland, 14.12.28.
A.8029.	Husavik, 15.7.28.	Laurencetown (Down), 20.8.28.
V.2080	Husavik, 5.7.28.	Longfield Flats, L. Foyle (Londonderry), 30.10.28.

No	Place and Date Ringed.	Place and Date Recovered.
TEAL (<i>continued.</i>)		
1035.	Fellsmula, 27.6.28.	Cashel (Tipperary), 27.11.29.
8030	Husavik, 3.7.28.	Ballinasloe (Galway), 10.1.29.
2055	Husavik, 24.6.27	Nr. Ballacroy (Mayo), 20.2.29.

WIGEON (*Anas penelope*).

3701	Husavik, 17.6.28.	Bay of Firth, Orkney, 15.9.28.
3861	Husavik, 21.7.28	Kirkwall, Orkney, 1.2.30.
3716	Husavik, 6.7.28.	Halkirk (Caithness), 28.9.28.
3849	Husavik, 15.7.28.	Wick (Caithness), 6.12.28.
829.	Husavik, 17.7.27.	Loch Eye (Ross.), 2.11.27.
3905	Husavik, 8.7.28.	Invergordon (Ross.), 25.12.28.
2019	Husavik, 5.7.28.	Elgin (Moray.), 8.10.28.
2010	Husavik, 23.6.26.	Loch Tarbert (Argyll), 24.12.26.
8069	Husavik, 31.7.27.	Lochgilphead (Argyll), 16.9.27.
8051	Husavik, 2.7.27.	Holy Island (Northumb.), 25.9.29.
3892	Husavik, 30.7.28.	Fleetwood (Lancs.), 15.2.29.
2045	Husavik, 18.6.27.	Rugby (Warwick.), 8.3.29.
2068	Husavik, 26.6.27.	Ipswich (Suffolk), 5.11.28.
3909	Husavik, 8.7.28.	Lough Swilly (Donegal), 9.10.28.
3737	Husavik, 25.6.29.	Toome (Antrim), 27.11.29.
3718	Husavik, 7.7.28.	L. Foyle (Londonderry), 14.12.28.
4773	Husavik, 4.8.29.	Rush (Dublin), 19.10.29.
2037	Husavik, 17.6.27.	Lady's Island Lake (Wexford) 27.1.29.

The movements of Wigeon from Iceland are very remarkable (even more so than our records from England to N.E. S.E. Russia, *antea*, Vol. XXI., pp. 97-8).

Besides the birds recovered in the British Islands and recorded above, Iceland Wigeon have reached S.W. Spain (1); France (2); Ravenna (Adriatic), (Italy (1); Tula (south of Moscow), Russia (1), while no less than four have reached America, viz., Newfoundland, Nova Scotia, Massachusetts and Maryland.

PINTAIL (*Anas acuta*).

3720	Husavik, 23.7.28.	Rathangan (Kildare), 8.12.28.
503	Husavik, 17.6.26.	L. Ahalia (Galway), 11.12.27.
509	Husavik, 17.6.26.	Castletownroche (Cork), 16.1.27.

TUFTED DUCK (*Nyroca fuligula*).

26802	Laxa, 25.6.27.	Northwich (Cheshire), 11.8.28.*
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* This is the bird referred to by Mr. A. W. Boyd (Vol. XXII., 143) as having been obtained from a bunch of non-breeding Tufted Ducks which frequented Witton Flashes throughout the summer of 1928. Although there is no absolute proof that this particular bird was with the bunch all the time, it seems likely that it was so. Mr. Boyd was only permitted to say that it was ringed as a young bird in 1927 in "a much higher latitude."

No.	Place and Date Ringed.	Place and Date Recovered.
SCAUP-DUCK (<i>Nyroca m. marila</i>).*		
E.665	Husavik, 1.8.28.	Nr. Kildary, Nigg Bay (Ross.), 3.8.29.
V.3698	Husavik, 22.7.28.	Trewern, Newbridge (Corn- wall), mid-Feb., 29.
D.1433	Myvatn, 27.6.25.	Belfast, 30.10.26.
E.511	Husavik, 22.7.27.	Belfast Lough, 23.1.29.
V.4028	Laxa, 8.9.28.	Tillysburn (Down), 23.2.29.
V.3719	Husavik, 5.7.28.	Duncormick (Wexford), 10.11.28.

NORTHERN GOLDEN PLOVER (*Charadrius a. altifrons*).

X.8075	Laxa, 4.7.28.	Tiree (I. Hebrides), 12.4.29 (found dead, decomposed).
G.7432	Reydarfirdi, 15.7.29.	Moniaive (Dumfries.), 22.2.30.
A.5517	Akureyri, 23.6.29.	Wigtown Harbour, 25.11.29.
X.3298	Myvatn, 26.7.29.	Hornby (Lancs.), 6.1.30.
A.3723	Husavik, 4.7.28.	King's Lynn (Norfolk), 3.2.30.
A.3126	Husavik, 24.6.29.	Cloughmills (Antrim), 26.12.29.
X.6463	Husavik, 4.7.27.	Ballinamore (Leitrim), 22.10.27.
X.6450	Husavik, 11.7.27.	Ballina (Mayo), 1.2.28.
†X.3640	Myrasysla, 26.6.28.	Ireland, Oct., 29.
‡X.2728	Husavik, 27.6.26.	King's Co., Ireland, 4.11.26.
X.6466	Husavik, 4.7.27.	Tullaroan (Kilkenny), 21.10.27.
X.2734	Husavik, 24.6.27.	Spanish Is., Baltimore (Cork), 30.1.28.
X.6871	Husavik, 5.7.29.	Carrigaloe (Cork), 6.1.30.

FÆROE SNIPE (*Capella g. faeroeensis*).

G.5303	Husavik, 2.7.29.	Claremorris (Mayo), Ireland, 5.11.29.
G.3880	Myrasysla, 25.6.28.	Ballina (Mayo), Ireland, Feb., 30.

GREAT BLACK-BACKED GULL (*Larus marinus*).

K.6121	Husavik, 27.6.28.	N. Uist (O. Hebrides), 3.1.29.
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* In *Danske Fugle*, p. 66, all the records under "Bjergand", called by mistake "*Fuligula cristata*", refer to the Scaup.

† Mr. G. R. Humphreys informs me that this ring was found on a bird in the Dublin City market. The bird was thought to have come from south-west Ireland, but the actual locality could not be traced.

‡ This bird has already been reported in our pages, Vol. XX., p. 250, but unfortunately the country of ringing was given as Denmark instead of Iceland.

NOTES

STARLING'S UNUSUAL NESTING-SITE.

THE accompanying photograph was taken in south Essex on April 26th, 1930. The old post, which is hollow almost throughout, stands in about three feet of water, and approximately as much of it is above the surface. The Starling's nest was about a foot down, and one of the birds is shown just prior



to entering the hollow. The Starlings had packed the hollow with straw and other material right down to water-level, and a few straws were protruding from the lower hole. There is no lack of better accommodation in the vicinity, and it is strange that they should have chosen such an apparently unsuitable site.

F. HOWARD LANCUM.

THE NESTING-PERIOD OF THE STARLING.

I AM not aware that any of our breeding birds start their nesting in any particular locality with greater regularity than the Starling (*Sturnus v. vulgaris*). During 1930 I kept

twelve nests under observation, but I did not note the particular date of their respective layings. The clutches I was able to examine all numbered four to five eggs.

On the evening of May 30th one lot of young were out of the nesting-box they occupied, but unable to fly owing probably to their feathers being caked with the foulness of their nesting-site; but, even so, they seemed fully young to leave the nest. The following day several broods departed, and other young ones I could hear exercising their wings in their nesting-abodes where space permitted. By June 1st six lots had flown altogether and by the evening of June 2nd all nests were void. Four other nests under my gardener's observation on his premises flew on the two latter dates. I am inclined to think nearly all the young leave their nests early on in the day.

The day following the broods leaving their nest the adults unaccompanied will frequently be seen again at their breeding-places, the young presumably having in the meantime joined up with other parties to form the large gatherings feeding on the larvæ that plague our woodlands. It is most likely from then that the broods lose their individuality of relationship, and further responsibility from family ties of the old birds ceases.

Oftentimes some of the old birds whose broods have departed return and will associate socially with others whose young have not as yet left the nest.

Three of the above twelve pairs took on the responsibility of a second brood, and the old birds were carrying into the nests fresh material on the evening of the day following the one on which the first brood left. I have noticed quite an unusual number of these late broods during the present year in various other localities.

J. S. ELLIOTT.

HAWFINCHES IN INNER LONDON.

ON June 17th, 1930, about 8.15 p.m., I heard the characteristic flight-note of the Hawfinch (*Coccothraustes c. coccothraustes*) over Rotten Row, near the Kensington Gardens end, and had a fair view of two passing over eastward towards the Dell at perhaps 150 ft. They were calling all the time. Starlings passing simultaneously gave a good check on shape and size. Although I have frequently seen Hawfinches about Esher, and sometimes in Richmond Park, I have never met any before in Central London. An exceptionally severe thunderstorm occurred two hours previously. E. M. NICHOLSON.

WOOD-LARK IN STAFFORDSHIRE.

I THINK it quite probable that the Wood-Lark (*Lullula a. arborea*) nests on certain commons in south-west Staffordshire. as on June 20th, 1929, I saw six birds on a common near Enville, which, from the short tail, distinct, pale, superciliary stripe and paler plumage (compared with the Sky-Lark), I feel sure were this species. They were very tame and allowed me to get within five yards of them as they walked in a procession through clumps of heather, and merely walked a little further away. Before leaving they flew into a tree. I am familiar with the Tree-Pipit and I have seen the Wood-Lark in Richmond Park (Surrey) as well. On July 14th, 1929, I found two singing on another common not far away. I intended going this spring to try and make more certain of its breeding in the locality, but unfortunately I have been unable to do so.

F. FINCHER.

TREE-CREEPER NESTING CLOSE TO THE GROUND.

WHEN staying recently at Cople in Bedfordshire I was shown the nest of a Tree-Creeper (*Certhia f. britannica*) in a sectional stump of an elm tree used as a garden ornament. The nest was normally placed, between the bark and the trunk, but was only two feet off the ground, the stump being under a yard high and placed within a few feet of the principal doorway to the house.

Tree-Creepers had, I learnt, nested in like situations in other stumps in the garden for the past two years also.

J. S. ELLIOTT.

[Although it is unusual for the Tree-Creeper to nest so near the ground, it occasionally does so. A nest containing seven eggs at Mapleton, Derbyshire, on May 25th, 1910, was only 9 inches from the ground at the foot of a dead beech tree.—F.C.R.J.]

NUTHATCH IN CARDIGANSHIRE.

ACCORDING to the *Practical Handbook* this bird is very rare in west Wales, so it may be of interest to mention that I saw two in a wood near Silian, in the south-eastern corner of Cardiganshire, on August 5th, 1926.

F. FINCHER.

GREAT TITMOUSE LAYING A SECOND CLUTCH BEFORE DEPARTURE OF FIRST BROOD.

A GREAT TITMOUSE (*Parus m. newtoni*) occupied one of a number of nesting-boxes and on May 10th, 1930, the nest

contained nine eggs. On the evening of June 11th the young were almost ready to fly and on June 13th they had left the box. I was surprised, however, to find on that date the nest had been practically rebuilt and contained five fresh eggs, which, owing to their type, left no doubt that they had been produced by the same bird.

Assuming that the young left on June 12th, it seems clear that four of the eggs must have been laid while the young were still in the nest, and that three were being covered by them when I made my visit on June 11th.

The second clutch did not go beyond five eggs and these hatched on or about June 26th. D. W. MUSSELWHITE.

PIED FLYCATCHER EATING WORMS.

IN connexion with Mr. A. Astley's note (*antea*, p. 52) on a Pied Flycatcher (*Muscicapa h. hypoleuca*) eating an earthworm, I can state that on various occasions I have seen three male Pied Flycatchers feed their offspring on thin earthworms of two to four inches in length. R. H. BROWN.

BLACKCAP LAYING TWICE IN SAME NEST.

Two instances of a Blackcap (*Sylvia a. atricapilla*) laying twice in the same nest have come under my personal observation this season in Berkshire.

On May 8th four eggs were removed from a nest, and on May 20th one egg of a second clutch was laid in the same nest. The bird subsequently sat on a clutch of three eggs and reared her young.

Again, on May 19th, a clutch of six eggs was removed from a nest, and on May 28th the same nest contained five more eggs. Both these nests were in the same district and each was built in holly.

I think the Blackcap was unusually numerous this year, although it is always a common bird in my district. Three clutches of six came under my own personal observation.

EDGAR P. CHANCE.

BLACKBIRD FEEDING YOUNG ON MINNOWS.

THIS spring (1930) a pair of Blackbirds (*Turdus m. merula*) built a nest in some creepers on a house in Westmorland, in such a position that it was in full view from the upstairs drawing-room windows. The garden of the house extends down to a river about 75 yards from the house. Towards the end of May, when the young were about half-grown, it was

first noticed that the cock was feeding them on minnows. He was repeatedly seen to bring up to three or four at a time, and on one occasion was distinctly seen to rub them in the dry soil of a flower-bed before taking them up to the nest, presumably to render them more gritty. It did not prove possible to ascertain how he obtained the minnows, but in May and June they visit the shallows in swarms, and the river was exceptionally low owing to very dry weather, so no doubt he must have been able to snatch them from the water in some way. A. ASTLEY.

EARLY LAYING OF CUCKOO IN CHAFFINCH'S NEST.

ON April 30th, 1930, a nest of a Chaffinch (*Fringilla c. cælebs*) at Plaistow, near Billingshurst, Sussex, contained four eggs. On May 1st there were only two eggs and on this date the Cuckoos (*Cuculus c. canorus*) were seen near the nest. On May 3rd there was a Cuckoo's egg in the nest and one egg of the Chaffinch was buried under the nest-lining, the remaining egg having vanished. The nest was very much damaged and flattened. The date for the Cuckoo's egg seems early. C. R. VERNER.

[There are several instances on record in which Cuckoos' eggs have been found in April, some of which are undoubtedly genuine. See *B.B.*, Vol. VI., p. 90; *Zool.*, 1904, p. 347, etc. —F.C.R.J.]

CUCKOO RINGED IN BUCKINGHAMSHIRE AND RECOVERED IN FRENCH CAMAROONS.

I HAVE received word from the Chef de la subdivision de Nanga Eboko, French Camaroons, that Père Patenode, Superieur de la Mission Catholique of that district, has requested the Administration des Colonies to forward a ring to me with the following report. On January 30th, 1930, at the village of Lembe, Nanga Eboko, a native shot with an arrow a bird as it was alighting on the ground. He was astonished to find that the bird bore a ring and brought this to the missionary.

This ring was No. Z.7928, and was placed on a young Cuckoo (*Cuculus c. canorus*) in a nest of a Pied Wagtail (*Motacilla a. yarrellii*) at Eton on June 23rd, 1928, by Mr. A. Mayall.

This is the first ringed Cuckoo reported from Africa and the record has very considerable interest. We have had

only two previous records of Cuckoos from abroad and both of these appeared to be taking a much more easterly route than is usual with other summer migrants to this country. One was reported from Muhlhausen, Germany (approximately $10^{\circ} 30' \text{ E.}$), on August 2nd, 1925, having been ringed in a Meadow-Pipit's nest in Ayrshire on July 7th, 1925.

The other was reported from Reggio, Emilia, Italy, almost due south of the German record, on August 21st, 1922, having been ringed also in a Meadow-Pipit's nest in Renfrewshire on July 9th, 1921.

The present bird, although found in west Africa, was far to the east of Greenwich and a little to the east of the other two birds, the position being approximately $12^{\circ} 10' \text{ E. Long.}$ and $4^{\circ} 25' \text{ N. Lat.}$

Although no conclusion of any kind can be based on so few records, these recoveries are interesting as they seem to indicate that the Cuckoo may take a more easterly route to the south than other summer migrants to Great Britain.

Mr. Mayall, who has ringed so many birds for so many years, fully deserves the satisfaction of having so interesting a return for his labours, and we are very grateful to Père Patenode and the French colonial officials for having taken so much trouble to report the case. H. F. WITHERBY.

INCUBATION-PERIOD OF SHORT-EARED OWL.

A NEST of Short-eared Owl (*Asio f. flammeus*) at Hickling, Norfolk, had two eggs when I found it, May 12th, 1930.

I have found many nests of this species during the past thirty years, and all the previous ones had the opening towards the east, but this one faced the north. Also the female flew off the nest about 20 yards to the male which had brought food. Generally the cock takes the food to the nest.

In the *Practical Handbook* it is stated that the incubation-period has not been ascertained and I do not find that it has been since recorded in *British Birds*, and the few following notes may be of some help in arriving at the incubation-period.

May 12th. Nest found. 2 eggs, very fresh-looking.

„ 14th 3 „

„ 16th 4 „

„ 18th 5 „

June 7th. The first young one was hatched.

„ 9th. Three young were out, and the fifth on June 11th.

On one visit to the nest there were nine short-tailed field-mice at the nest, which Mr. W. E. Higham included in his film of this bird.

The young of this species radiate out from the nest to all points of the compass, sometimes 100 yards from the nest. The last young one had left the nest on June 26th and was found 10 yards away. J. VINCENT.

[As the eggs were laid at two days intervals and the young hatched at one day intervals, it is probable that steady incubation began when about half the eggs had been laid. If we take the period from the last egg in this case at twenty-four days, it is rather shorter than one would have expected, when compared with the evidence in the case of the Long-eared Owl.—F. C. R. JOURDAIN.]

DIET OF YOUNG BUZZARD.

A YOUNG Buzzard (*Buteo buteo*) was captured on July 7th, 1929, and tied up in a wood in Pembrokeshire. It was fed by the parent birds, who visited it each day, and the following record was taken of its daily meals.

July 7th.	1 rabbit, 1 mole, 1 mouse, 2 Pheasants.
„ 8th.	1 rabbit, 1 Moorhen, 1 chicken.
„ 9th.	1 rabbit, 1 Moorhen, 1 mole.
„ 10th.	4 rabbits, 1 mole.
„ 11th.	2 rabbits, 1 mole, 1 Blackbird.
„ 12th.	3 rabbits, 2 moles, 1 Pheasant.
„ 13th.	3 rabbits, 1 mole.
„ 14th.	2 rabbits, 1 mouse, 1 weasel.
„ 15th.	4 rabbits, 1 mole.
„ 16th.	2 rabbits, 1 Pheasant.
„ 17th.	2 rabbits, 2 moles.
„ 18th.	2 rabbits, 2 moles, 1 Pheasant.
„ 19th.	2 rabbits, 1 mole, 1 Pheasant.
„ 20th.	2 rabbits, 1 mole, 1 mouse.
„ 21st.	3 rabbits.
„ 22nd.	1 rabbit, 8 moles.
„ 23rd.	1 rabbit, 1 mole.
„ 24th.	1 rabbit.
„ 25th.	2 rabbits, 1 mole.

The parent bird came each day until the 25th, but was bringing less food, so the young one was released.

GLADYS SEYMOUR ALLEN.

INCUBATION-PERIOD OF MARSH-HARRIER.

A NEST of a Marsh-Harrier (*Circus a. æruginosus*), to which I had watched the birds carrying material, was visited by me for the first time on May 10th, 1930, and contained one egg.

On the 14th there were two eggs and on the 19th five eggs. The nest was not visited again until May 24th, when it contained six eggs, a record clutch here for this species.



Nest of Marsh-Harrier with six eggs, Hickling, Norfolk,
May, 1930.

(Photographed by Mrs. S. A. Wilson.)

On June 12th, with Mr. and Mrs. Arnold Boyd, I visited the nest and we saw the first young one just hatched. Reckoning that the bird incubates as soon as the first egg is laid (which I have ascertained by previous observation) the incubation-period in this case is thirty-three days.

On June 14th there were two young, on the 17th four, and on the 19th a fifth young one which only lived a few days.

On July 18th the first young one took its first flight for about forty yards from the nest.

The *Practical Handbook* gives the incubation-period of this species as "over five weeks." J. VINCENT.

[There is one previous record of a clutch of six eggs of this species from Norfolk. From the fact that two young are

usually hatched first on the same day, it would appear that incubation begins with the second egg in most cases, but in this instance it is clear that it began with the first egg laid. See H. Weiss on this subject.—F. C. R. JOURDAIN.]

CLUTCH OF TEN EGGS OF MONTAGU'S HARRIER.

At Hickling, Norfolk, a pair of Montagu's Harriers (*Circus pygargus*) arrived on April 23rd, 1930, and had two eggs when I looked at the nest on May 11th, 1930. On the 14th there were three eggs, 17th 4 eggs, 19th five eggs, 22nd seven eggs,



Nest of Montagu's Harrier with ten eggs, Hickling, Norfolk, May, 1930.

(Photographed by Col. R. Meinertzhagen.)

24th eight eggs and the same on the 26th, on the 27th there were nine eggs and on the 30th ten.

I feel certain this remarkable clutch of eggs was the product of one bird, both on account of the intervals of laying and also because the female would not tolerate another female

near the nest, nor would the cock if the female was away eating the food he had brought, as he nearly always sees her back to the nest and guards it.

I was very anxious to watch the result of hatching and rearing of young at this nest, but unfortunately it was robbed by someone off a yacht on the evening of June 2nd, or early on the 3rd.

I can assure the culprit that he was very fortunate in escaping, as he would never have forgotten the penalty which we should have inflicted upon him. It is too much to expect a person of this mentality ever to understand that by taking this clutch he has done an unscientific act, but I feel sure that should this clutch ever be seen by egg-collectors who have any regard for science that they will impress this point upon the person concerned.

There is another aspect of the case: since 1910 we have been very fairly treated at Hickling by egg collectors, and I appreciate their attitude to us and to the rare birds we are doing our best to foster and bring back to a more secure position as breeding-species. I feel it is "up to" egg collectors to convince defaulters that an act of this kind is inexcusable from all points of view other than the cult of mere acquisition.

J. VINCENT.

BREEDING OF THE GARGANEY AND TUFTED DUCK IN DORSET.

MR. A. BLINN informs me that since the establishment of the Sanctuary at Weymouth in 1928 there has been a decided increase in the number of breeding ducks in the neighbourhood. The nesting of the Garganey (*Anas querquedula*) near Lodmoor in June, 1929, was recorded in *Brit. Birds*, Vol. XXIII., p. 99, and another nest of this species with eight eggs, evidently much incubated, was discovered by Mr. Blinn in the same district on June 10th, 1930. The evidence of the breeding of the Tufted Duck (*Nyroca fuligula*) in Dorset has hitherto been somewhat unsatisfactory. Newton stated that it bred in Dorset in 1876, but gave no details, and the Rev. F. L. Blathwayt was shown down from a nest with twelve eggs in 1926 which probably belonged to this species. There is little doubt that Tufted Duck have bred either in the Sanctuary or close at hand for two or three seasons past, and Mr. Blinn flushed a duck from a nest with seven or eight young and two addled eggs in the neighbourhood on June 6th, 1930. A sample of the down and feathers from this nest is quite typical.

F. C. R. JOURDAIN.

BRENT GOOSE IN CO. DOWN IN MID-JUNE.

WHEN out sailing in Strangford Lough on June 14th, 1930, we observed standing on a rock on the point of one of the islands a Brent Goose (*Bernicla brenta*). We landed, and I walked up to within 30 yards of it, when it got up and flew in a perfectly normal way to another island about 500 yards away. I made a very close observation and there was no evidence whatever of the bird being either lame or maimed in any way.

HAMILTON ARMSTRONG.

[For two similar records, see *B.B.*, Vol. XXI., p. 65; Vol. XXII., p. 91.—EDS.]

WOOD-SANDPIPER ON LUNDY ISLAND.

ON June 8th, 1930, we saw a Wood-Sandpiper (*Tringa glareola*) on Lundy Island. The bird was first put up by T.H.H. at 6.30 a.m. in the field behind the church, where it remained all day, haunting two small ponds and returning to them quickly when disturbed. Owing to the regularity of its behaviour, one of us was able to hide under a wall while the other put the bird up, and, after a short flight, it alighted about seven yards away. It was observed through a good glass, and a most detailed description was made of it. The pale grey underside of the wing in flight distinguishes it at once from the Green Sandpiper (*Tringa ochropus*). The call-note we rendered "tü-tü", or "tü-tü-tü", a piping note sometimes repeated five or six times in one key. At 10.01 p.m. B.S.T., when we were indoors, we heard the bird pipe for the last time, presumably as it was leaving, as it was not there in the morning.

T. H. HARRISON.

V. C. WYNNE-EDWARDS.

WOOD-SANDPIPER IN CUMBERLAND.

ON April 29th, 1930, at a pond in Workington, I watched a Wood-Sandpiper (*Tringa glareola*) for over an hour. It was very busily engaged searching for food, associating all the while with a Redshank, in comparison with which it was obviously smaller and much more slender in proportion, as well as being more active. The wings were frequently raised tip to tip, showing the light colour underneath. The legs were very light yellowish-green.

M. MCKERROW.

BLACK-TAILED GODWIT IN KENT.

ON June 7th and 8th, 1930, I saw a Black-tailed Godwit (*Limosa limosa*) on the Leysdown Marshes, Sheppey. The

bird, which was in immature plumage, was not at all shy and I was able to watch it for a considerable time on both occasions. On June 9th it had disappeared. E. L. KING.

RARE BIRDS FROM FAIR ISLE.—The following scarce visitors to Fair Isle, Shetlands, are recorded in recent issues of the *Scottish Naturalist* for 1930.

ROSE-COLOURED STARLING (*Pastor roseus*).—A young male on November 15th, 1929 (J. Wilson, p. 8).

SCARLET GROSBEEK (*Carpodacus e. erythrinus*).—Three were seen on January 11th, 1930, associating with Sparrows, and at least one was seen subsequently. They are thought to have wintered on the island (G. Stout, p. 60).

SHORT-TOED LARK (*Calandrella b. brachydactyla*).—A female was obtained on May 10th, 1930, and has been identified as of this form at the Royal Scottish Museum (J. Wilson, p. 94).

WHITE'S THRUSH (*Turdus d. aureus*).—An adult male was obtained on October 19th, 1929, and is now in the Royal Scottish Museum. This is only the third recorded occurrence in Scotland (G. Stout, p. 8).

WESTERN DESERT-WHEATEAR (*Ænanthe d. homochroa*).—A male was obtained on October 26th and its identification as of this race was confirmed by Dr. Hartert. It is remarkable that a year before, a Desert-Wheatear of the typical race was obtained on the island (see *B.B.*, *antea*, p. 22). Two other Desert-Wheatears have been obtained in Scotland, but these have not been critically examined (J. Wilson, p. 8).

WHITE STORK (*Ciconia c. ciconia*).—One arrived on the island on April 6th (G. Stout, p. 60).

MAGPIE AND HERONS NESTING IN SAME TREE.—With reference to Mr. W. D. Shaw's note (Vol. XXIII., p. 66) Mr. N. T. Walford writes that the Magpie (*Pica p. pica*) and the Heron (*Ardea c. cinerea*) have again nested in the same tree in Savernake Forest; the two nests are about ten feet apart and both birds reared their young. He also mentions a second instance where the Magpie built in the same tree as two pairs of Herons.

WHITE WAGTAIL IN STAFFORDSHIRE.—Mr. F. Fincher writes that he saw one *Motacilla a. alba*, and he thinks one or two more, amongst a flock of *M. a. yarrellii* on Walsall Sewage Farm on May 1st, 1930. The bird's back was pure grey and the flanks were quite light, contrasting strongly with the Pied Wagtails.

CUCKOO'S EGG IN BLACKBIRD'S NEST.—Mr. C. W. Colthrup writes that in May, 1929, he found an egg of a Cuckoo (*Cuculus c. canorus*) together with one egg of the fosterer in the nest of a Blackbird (*Turdus m. merula*) in east Surrey.

LARGE CLUTCH OF KESTREL'S EGGS.—Mr. C. W. Colthrup informs us that he found the nest of a Kestrel (*Falco t. tinnunculus*) in a hole in a cliff in east Kent in May, 1929. It contained a clutch of eight eggs. Clutches of more than six in the case of this species are unusual, and eight eggs have only been recorded about four or five times, while there is one instance of nine on record.

ESCAPED BUFF-BACKED HERONS IN SURREY AND DEVONSHIRE.—The Rev. F. C. Butters has sent us a detailed account of a Buff-backed Heron which has been observed in south Devonshire since June 16th, 1930. Mr. Butters has watched the bird most carefully and has given very good evidence to prove its identification, which has been confirmed by Mr. W. Walmesley White and others. Mr. Butters described the bird as wary and not as behaving like an escape from captivity. This, however, it would seem certainly to be, since Mr. Alfred Ezra states that he liberated five at Foxwarren Park, Cobham, Surrey, in April, and has lost two of them (*Times*, July 24th, 1930). One was reported in May from Godalming as having died of starvation (*Field*, June 7th, 1930, p. 851), and Mr. Ezra has no doubt that the bird observed by Mr. Butters, whose description of the bird Mr. Ezra has read, is the other. These birds were of the Indian race, *Ardeola ibis coromanda*, which is very nearly allied to the European bird.

No doubt there is some personal gratification in liberating fully winged captive birds, but when these are of species likely to occur naturally in the country in which they are let loose, the result is most confusing to ornithologists. Owing to this growing habit of aviculturists, it has become impossible to accept occurrences of many species as those of genuine wild birds, and our knowledge of the distribution of such birds is thus severely handicapped.—EDS.

SHELD-DUCK NESTING IN GUN-EMPLACEMENT IN KENT.—Mr. E. L. King writes that on June 11th, 1930, he found the nest of a Sheld-Duck (*Tadorna tadorna*) containing five eggs, possibly more, in the opening of a gun-emplacement built into the sea-wall in the Isle of Sheppey. When disturbed the bird flew out of the door, but normally she entered and left the nest by tunnelling through the thistles and long grass on the sea-wall.

REVIEW.

This Bondage. By Commander Bernard Acworth, D.S.O., R.N.
pp. 229 + xxiv. 7s. 6d. net. (John Murray, London, 1929.)

"In this book the author has undertaken to prove that the 'Freedom of the Air' is in reality a terrible and iron bondage". He further explains its scope in the sub-title: "A Study of the 'Migration' of Birds, Insects and Aircraft, with some Reflections on 'Evolution' and Relativity". Here, however, notice must be restricted to the sections directly concerned with birds.

The author bases his main argument upon three statements, two of which everyone will admit to be true, and the third of which he himself admits to be pure assumption. He begins with the well-known fact that a bird or any other flying thing is in effect part of the body of air in which it flies, that its own movement is relative to that body, and that it is therefore incapable, once it has left the ground, of feeling either the strength or the direction of any wind there may be: it feels, indeed, only the head-on draught caused by its own passage through an apparent calm. This fact is a commonplace to everyone with the most elementary knowledge of physics, has been brought home by analogy to anyone who has ever rowed or swum in a current, and is a familiar factor in aviation. Yet the author believes that it is unknown to ornithologists, whom he roundly abuses on that account. Although he can quote from writers on birds who seem not to have thought clearly on the point, one can nevertheless assure him that the "law", with its implications of "air speed" and "ground speed", is correctly stated in serious modern works dealing with aspects of ornithology to which it is relevant, and that if other authors have taken so obvious a truism for granted they need not therefore be considered as necessarily ignorant; one can also assure him that ornithologists have for long treated as a joke the old statement that a bird dislikes flying with a tail-wind because the air gets under its feathers!

There are two qualifying circumstances on which the author perhaps lays too little stress. Different parts of a current of air may move at different rates, and on passing from one to another, as also in the act of leaving the ground, the bird experiences change of inertia and may thus momentarily feel the wind in some degree. Again, the bird can under most conditions see what progress it is making in relation to the ground.

The author's second "law" is scarcely less a truism. It is that air-borne bodies *heading continuously for a fixed point* through an air-current must proceed on a curve and must arrive at the destination exactly head to wind. This is how a novice proceeds in rowing across a river, whereas the experienced boatman points the bow towards a higher point and actually crosses in a straight line; the navigator can similarly allow for currents in setting a course for a distant goal, whereas the unskilled sailor who knows only the direction from his starting point will be carried wide of the mark.

From these undisputed physical facts, the author proceeds to the assumption that birds flying across the sea do in fact head continuously for a fixed, although unseen, point. This, he supposes, is made possible by the possession of an inherent "sense of direction", which in this case takes the form of an "inherent power to sense a given

spot in space". This seems a remarkable assumption on the part of one who professes to despise all biological explanations, but, be that as it may, Commander Acworth hangs upon its validity "the whole concept of this book". He indeed claims, at a later stage, to have proved its truth, but his arguments are purely theoretical, and in the absence of any real evidence the idea cannot be accepted as more than an interesting speculation. The chapter in which the author develops the practical side of the theory, giving examples of different flight-curves, is probably the most useful part of his book; the topic has certainly been neglected by ornithologists, who, while aware of the physical "law", have not usually worked upon the assumption added to it by Commander Acworth.

The author notwithstanding, it is a matter of observation that migrants do at least sometimes fly by recognition—whatever that may mean psychologically—changing direction to follow, say, some bend of coastline. It is true that, in a lateral wind, flying by recognition should theoretically be on a series of curves, but the degree of curvature would depend upon the intervals between landmarks and might often be negligible. In those cases where flight by recognition seems to be impossible, there is another alternative to Commander Acworth's view. The unseen goal is not necessarily a point, as he supposes, but may be a broad target, such as the whole seaboard of a country. Assuming that a bird can set out on a sea-crossing in the general direction of this target, and that it can keep flying straight ahead, a certain amount of lateral drift due to wind need not matter: an excessive amount of drift would, on the other hand, take the birds wide of their target and might lead to total disaster, accidents which are, indeed, known to occur. This theory is also purely speculative, but it is provisionally to be preferred because it involves a less difficult initial assumption. Writers not so dogmatic as Commander Acworth will at least be content to regard the matter as unsettled until definite evidence is available.

Having first explained migration, the author then proceeds to explain it away. He is, in fact, unwilling to admit that there is any such thing, unless in extreme cases like that of the Swallow. In the case of the hardier birds which perform shorter journeys, he thinks there is merely seasonal "drift" due to the prevailing winds. Space here does not permit of any fuller statement or examination of this further theory; suffice it to say that ornithologists will readily recognise that it will not fit the salient facts, many of which the author either mistakes or wholly ignores. Birds simply do not behave as his theory demands they must.

For further details, reference must be made to the book itself, but the reader will not find any detached or balanced discussion of the subject. The whole is indeed an elaborate piece of special pleading on behalf of the author's peculiar views. It is in places amusingly vehement, and the author makes no secret of his rather numerous prejudices against ideas and people. He disbelieves, *inter alia*, in evolution, cosmic relativity, vitamins, and the prospects of aviation—in fact, one is tempted to conclude, in anything which goes beyond the biology of the Old Testament, the physics of Newton, or navigation on the surface of the sea! His incursion into ornithology may perhaps stimulate fresh attention to the influence of wind on migration, as to which there is still much to be learnt, but it cannot be said to make any positive contribution to definite knowledge of the subject. A.L.T.

LETTERS.

NESTLING WILLOW-WARBLEDERS HISSING.

To the Editors of BRITISH BIRDS.

SIRS,—With regard to Miss B. A. Carter's note (*antea*, Vol. XXIII., p. 161) *re* nestling Willow-Warblers (*Phylloscopus tr. trochilus*) hissing, I am certain that in previous years I have had occasional broods hiss at me when I disturbed them, but apparently I have made no note of the fact. I therefore paid particular attention to the subject this year and note that two broods hissed at me when I placed my hand near the nests. Both broods were a week or more old. R. H. BROWN

"NIGHT SOARING OF SWIFTS."

To the Editors of BRITISH BIRDS.

SIRS,—I have read with interest Mr. P. W. Masson's article on this subject (*antea*, pp. 48-50). Mr. Masson is of the opinion that if Swifts do come down from their late evening soaring they do not re-enter their nests, as to do so in the dark would be dangerous, if not fatal. My observations prove that Swifts, or at any rate some of them, do come down at nightfall, and that they enter their nests sometimes quite in the dark. Several pairs of Swifts regularly build within my house roof, and it has been a matter of great interest on various occasions to find odd birds trying to get to their nests in the deep dusk—and all the deeper because theirs is the east side of the house. A sudden swish of wings overhead, and a "flap" as the bird strikes the eaves, is often the only intimation of the arrival. Then generally we see the dusky Swift fly round again, as it often makes several attempts before hitting upon the exact spot desired. (This, indeed, also happens by day.) No sound is uttered by these late-comers, yet once inside their home soft wheezy notes are usually heard. Sometimes the darkness is such that it is difficult to see the arriving bird at all. It seems pretty evident that the Swift can see fairly well in the dark.

JAMES J. CASH.

LYMM, CHESHIRE. July 13th, 1930.

CUCKOO WITH SAME NOTE RETURNING FOR TWELVE YEARS.

To the Editors of BRITISH BIRDS.

SIRS,—The following may be worth recording, as throwing a possible light on the age to which a Cuckoo (*Cuculus c. canorus*) may live.

In 1917 a Cuckoo came to this valley with a distinctive and somewhat irritating note. From the day of arrival it called "cuck-oo-oo," not in the least like the stammering "cuck-cuck-oo" so common later in the season.

Every year since a bird with the same call has returned until this year (1930) when it has not been heard.

Unless the call was transmitted to offspring it would seem to have been made all these twelve years by the same bird.

H. H. GORDON CLARK.

MICKLEHAM, SURREY.

[For similar records, see Vol. XXII., p. 23.—EDS.]

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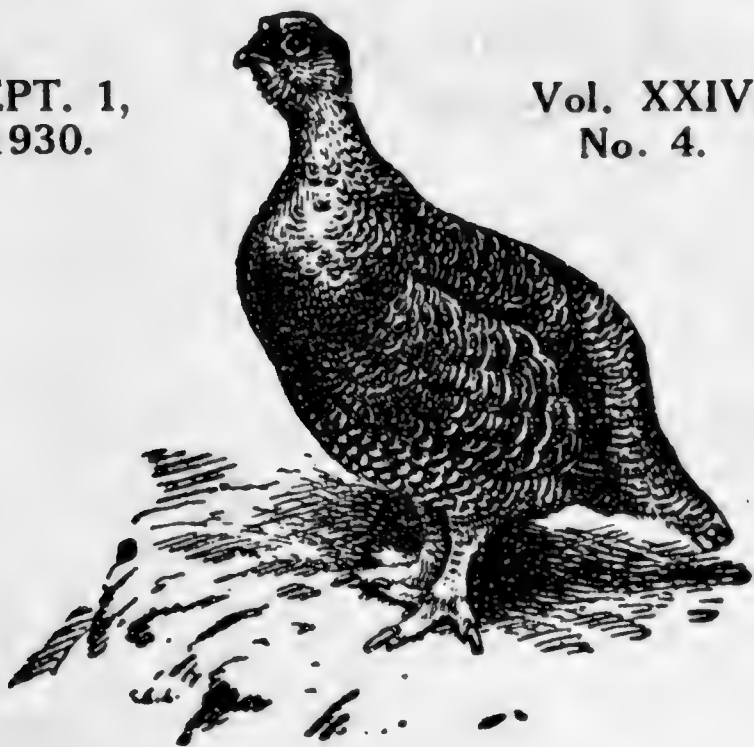
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BRITISH BIRDS

WITH WHICH WAS INCORPORATED IN JANUARY, 1917, "THE ZOOLOGIST."

EDITED BY

H. F. WITHERBY, M.B.E., F.Z.S., M.B.O.U., H.F.A.O.U.

ASSISTED BY

REV. F. C. R. JOURDAIN, M.A., M.B.O.U., H.F.A.O.U., F.Z.S., AND

NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U.

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The apparent failure of the birds to go to ground periodically after incubation has commenced and so to be located by steady watching is as baffling as it ever was. While collecting invertebrates on the jackpine ridges we had some opportunity of keeping a fairly close watch over the breeding areas of the shank, sometimes for hours on end. We never saw a bird go either up or down. It struck me that first thing in the morning the sitting birds must go off to feed or



Nest and eggs of Greater Yellowshank, Alberta, May 26th, 1930.
(*Photographed by W. Rowan.*)

their mates would have to go down to feed them. Accordingly, I made my way into the centre of a large breeding area at daybreak, soon after 2 a.m., and ensconced myself in blankets (there was a heavy frost) on the top of a commanding hill. By 6.30 I was so cold that I made my way to camp and breakfast. Mists, rising from the lakes and muskegs, were then making vision through the binoculars almost impossible. During this time I never saw a single Greater Yellowshank either leave the grounds or arrive on

them, although several birds passed singing and switchbacking overhead. On the night of May 20th, to the accompaniment of a terrific gale, we had a fall of wet snow measuring 13 inches on the level. It covered everything for two days before it disappeared. On both days tramps were taken over the most likely areas in the hopes that birds leaving their nests (assuming that they had not deserted during the night of the blizzard) would leave unmistakable traces on the universal pall of snow. We met with complete failure, although holes in the snow would have been readily seen at many yards. The obvious (but entirely erroneous) conclusion was that the birds had deserted, yet on the 29th the first young had been safely conducted into the muskeg and thereafter the number of families increased steadily. When we left on June 4th the whole locality seemed to be swarming with them!

NOTES ON MONTAGU'S HARRIER.

BY

CAPTAIN GEOFFREY CORLETT, R.N. (Retired).

IN 1928 I was lucky enough to have two nests of Montagu's Harrier (*Circus pygargus*) under observation, the first from the laying of the eggs until the young were able to fly, the second from the time the two young it contained were some three weeks old.

In 1929 I found a nest with two eggs on May 17th, in almost the identical spot as the first nest of 1928. This pair completed the clutch to four eggs and successfully hatched out and reared the young. I was able to observe this nest almost daily for several hours for nearly three months.

All these three nests were in the same marsh of some three acres in extent, rushes and sedge and very quiet, but with cattle and horses feeding round ; the nest was only a depression of sedge, with rushes some two feet high all round and screened by some low willow rushes.

The difference in plumage in both the adult birds and the young is very noticeable and makes a most interesting study, especially the dark brown or melanistic type, also the variations in the coloration of the irides. Some are dark brown and others bright yellow. Also, there does not seem to be any definite record of the adolescent period.

To give further details, the first pair of birds I had under observation in 1928 were of the ordinary adult plumage as shown in Thorburn's *British Birds*. *Male*: Dove-blue with black wing-tips. *Female*: Ruddy-brown with very conspicuous white bar across tail. Both presumably adult birds in full breeding plumage.

The first egg was laid on May 15th and the full clutch of five eggs by May 25th. The hen bird sat very close from the beginning and was only flushed off her eggs at a distance of a few feet. The first chick was hatched out on June 10th, three chicks by June 15th, the fourth egg was infertile, and the fifth chick was hatched on June 20th.

By July 6th all four youngsters were out of the nest and some feet away in the rushes. All four were of a buff (chestnut) colouring, the youngest still in white down, and all had yellow irides.

During June a third bird had been frequently seen, a very small, dark bird, and we were under the impression that this

was a first-year male. I suspected a second nest, but protracted search failed to verify this, until on July 30th, when the rushes were being cut, a second nest was exposed some three hundred yards from the first.

The two young birds in this nest (about three weeks old) were of the melanistic type—very dark blue-black, with brown eyes, totally different from the four chocolate young with yellow eyes in the first nest. The female was flushed off the nest and proved to be a large brown bird, with no white bar on the tail and no white on her whatsoever. Presumably the small brown bird previously mentioned was the male parent of these two melanistic chicks.

Towards the end of April, 1929, we were on the look-out for their return and were lucky enough to see three Harriers over the marsh, one an adult blue male and two dark brown birds (no white bar). On May 1st we watched these three birds for some time, but could not decide whether the two brown birds were female or immature males. On May 17th we observed the blue male and a brown female quartering the marsh and soon discovered the nest, practically in the same spot as the last year's first nest. It contained two eggs and the full clutch of four was laid by May 21st. All hatched out, the first on June 12th and the last on the 19th.

The parent birds of this nest were a blue adult male and the hen bird was a very small dark brown bird with no white at all, and I am convinced a different bird to that of 1928, but the male was presumably the same and had brought his new mate back to his previous year's nesting-site. The four chicks grew rapidly, but it was obvious from the first that the second chick hatched was of the melanistic type. The first chick was a buff bird, the second dark brown, while the third and fourth were similar to the first.

The first, third and fourth were all covered with white down, the second was covered with a grey-blue down, like a fowl after it has been dusting in ashes.

All four had dark brown irides, whilst the hen parent (the small, dark brown one) had yellow irides.

At the end of June, 1929, I had the opportunity of visiting another county and was shown two nests of Montagu's Harrier. Each nest contained two chicks of the usual light buff variety, *but with dark irides*. In both cases the parent birds were in the usual full adult plumage—the male blue and the female brown-chestnut with a very conspicuous white bar. *All* the youngsters had the very conspicuous white bar on the tail at four weeks old.

In *British Birds* of October, 1929, Mr. Harrison states that at one nest he had under observation the female was an *immature* bird with brown eyes. It would be interesting to know what was the coloration of both the parent birds and young in the three nests under observation in Norfolk.

Re the female carrying sedge to the nest, as reported by Mr. Harrison, I also observed the female do this, and discovered that the sedge was brought to build a new nest alongside the first, as soon as the youngsters were too big for the original.

This year (1930) we were again fortunate enough to have two nests under observation.

One pair, the male blue, the female very small and dark brown, nested in a small marsh 400 yards over the road from the 1928-29 marsh. I feel convinced these were the same pair of birds as 1929. Two eggs were laid by May 11th and a third later, but only one hatched out, one being taken by a boy and one infertile. The young chick, hatched on June 11th, rapidly showed all signs of its melanistic hen parent, and at four weeks old the primaries and tail-feathers were showing black, but a buff patch was showing on the back of the neck.

A second nest was located on May 30th, a mile down the valley and river from the first nest, and contained four eggs; the parent birds were observed to be a blue male and a light brown female, with a most conspicuous white bar across the rump.

All four eggs hatched out successfully, and on June 12th the nest contained two chicks and two eggs. On the 14th the third chick was out and the fourth egg chipping. On the 18th the fourth chick was out, and all four were well-developed and of the normal buff-colour.

At four weeks old the melanistic chick in No. 1 nest had dark irides as black as the pupils, whilst the first chick in No. 2 nest, of the same age and normal coloration, was developing very much lighter irides, almost yellow, as compared with the darker pupil.

By July 21st all the chicks were strong on the wing and could fly 150 yards round the marsh.

Both nests were of small structure when the eggs were first laid, but were considerably built up at frequent intervals.

Observations on five nests in three years prove that the female incubates from the first egg laid, the eggs are laid at an interval of thirty-six hours to three days, and each egg hatches out on the twenty-eighth or twenty-ninth day of incubation, and the average clutch is four eggs.

SOME ESSEX BIRD NOTES (1929-1930).

BY

JAMES W. CAMPBELL.

THE following are short notes on the status of some uncommon birds in Essex. Although two books dealing with the bird-life of the county have been published, the status of many species is still somewhat obscure. On looking through Mr. Glegg's *History of the Birds of Essex*, the lack of recent records in the case of several species is very noticeable, especially as regards those that frequent the coast. An annual report on the bird-life of the county would be of great interest.

TWITE (*Carduelis f. flavirostris*).—There seem to be no recent records of the occurrence of the Twite in Essex. Mr. Glegg remarks that all occurrences should be recorded.

On October 1st, 1928, a single Twite was seen in a flock of Linnets which rose from a stubble field near Great Yeldham.

On November 23rd, 1929, a pair passed close to me on a marsh near Tolleshunt D'Arcy, and sought shelter in the reeds on the approach of a thunder-storm. I know the species well in its breeding-haunts.

LONG-EARED OWL (*Asio o. otus*).—As Mr. Glegg found that this Owl was scarce in Essex during the breeding-season, the following record of a regular nesting-haunt may be of interest. There is a fir plantation in the Tiptree district where two or three pairs nest annually. The eggs, as a rule, are placed in old Magpies' nests. The Owls are not molested, and when shooting through the wood in winter it is quite usual to see seven or eight on the wing at once. During winter they roost together in two or three trees which are used for this purpose every year.

Mr. J. Pettitt tells me that a pair or two nest in a small fir plantation near Great Horkesley.

MARSH-HARRIER (*Circus æ. æruginosus*).—On December 6th, 1929, I watched an adult female of this species on a marsh near Tolleshunt D'Arcy. When first seen, the bird was resting on a marsh gate and an excellent view of it was obtained through field-glasses. It was seen subsequently several times during the same day. I have seen the species before and on this occasion was able to make out the distinctive features of its plumage quite easily.

LONG-TAILED DUCK (*Clangula hyemalis*).—An immature drake was obtained on the Blackwater on January 1st, 1930,

by Mr. I. Hills. It was the only one seen at the time. Mr. Pettitt, who preserved the bird, found that it was in excellent condition.

GREAT NORTHERN DIVER (*Colymbus immer*).—A note of mine was published in *British Birds* (Vol. XXIII., p. 102) stating that this species had occurred for the last three years on a certain part of the Blackwater. On January 1st, 1930, Mr. Pettitt saw two, and on February 15th, 1930, I saw one, both records being from the same haunt as in past seasons.

BLACK-THROATED DIVER (*Colymbus a. arcticus*).—An adult in full summer plumage was seen by Mr. W. Cole close to Walton pier in the first week of July, 1929. The bird made no attempt to dive and was no doubt wounded. Mr. T. H. Harrisson tells me that he saw one on the Blackwater on February 8th, 1930. On February 15th, 1930, one assuming summer plumage was seen on the Blackwater near Tollesbury.

RED-THROATED DIVER (*Colymbus stellatus*).—Mr. J. Pettitt observed one on the Blackwater on January 1st, 1930. On the 19th I found one washed up on the shingle near Colne Point. This bird had been dead some days and was badly oiled about the breast.

TURNSTONE (*Arenaria i. interpres*).—Mr. Glegg regards this bird as "an uncommon double-passage migrant which has been recorded every month of the year except December, January and February," and this is commented on in the review (*B.B.*, Vol. XXIII., p. 47). As I considered that the Turnstone was more abundant on the Blackwater than Mr. Glegg's status implies, I recorded (*t.c.*, p. 102) that Turnstones were reported from Mersea Flats in December, 1928. On February 8th, 1930, Mr. T. H. Harrisson saw a party of seven near Bradwell, on the south shore of the Blackwater. Although the late Mr. Miller Christy stated that the Turnstone sometimes occurs in winter, he gave no instances, so that it seems that Mr. Harrisson's is the first record of its occurrence during February. On February 15th, 1930, I paid a visit to the Blackwater estuary. There was a very high tide and large flocks of "Waders" were forced off the flats on the Bradwell shore to the saltings on the north bank of the river. During high water, four Turnstones were seen resting with a flock of Dunlin. Subsequently, seven or eight more were seen on the wing.

The Turnstone as a rule prefers the shingly coasts, but during their stay here, where there is comparatively little

shingle, they spend much of their time on the mud. For the last few years this part of the coast has been undergoing a change, banks of shingle and sand washing up and replacing what was once mud. It is quite possible that this has influenced the status of the Turnstone in the district.

SPOTTED REDSHANK (*Tringa erythropus*).—There are apparently only about a dozen published records of the occurrence of this species in Essex. On September 27th, 1929, a single Spotted Redshank was flushed from the saltings by the side of Tollesbury Creek. There were several Common Redshanks on the wing at the same time, so that the larger size of the former, together with the smaller amount of white on the wing and the larger amount on the rump, was clearly apparent, while identification was confirmed by the difference in their alarm notes.

LITTLE AUK (*Alle alle*).—Mr. J. Pettitt informs me that he and Mr. I. Hills saw eight or nine Little Auks on the Blackwater off West Mersea on January 1st, 1930. Two were obtained which on examination were found to be in very poor condition.

PUFFIN (*Fratercula arctica*).—Mr. J. Pettitt saw one on January 1st, 1930, off West Mersea.

NOTES ON CUCKOOS IN 1930.

BY

EDGAR P. CHANCE.

IN my experience Cuckoos (*Cuculus c. canorus*) have been with us in abundance this season. As a consequence, there should be some interesting experiences to record.

The following have come under my notice.

On May 29th I was out in Berkshire with my friend, O. R. Owen, when he found a nest of a Blackbird (*Turdus m. merula*) containing four of its own eggs and one Cuckoo's, all being fresh. An explanation for this exceptional combination may be that a Hedge-Sparrow's nest containing fresh eggs a few days before in the same rhododendron had meanwhile come to grief and was therefore not available for the Cuckoo when she went to lay. It would be instructive if egg-collectors, on finding anything exceptional, would seek for evidence which might help to explain matters—we found Cuckoo eggs in Hedge-Sparrows' nests in the same wood, but none laid by this Cuckoo.

On June 11th, in Radnorshire, O. R. Owen found a nest of a Meadow-Pipit (*Anthus pratensis*) containing three eggs of the Cuckoo, the product of two Cuckoos. On two previous occasions, once on June 17th, 1923, and again on June 3rd, 1928 (*vide antea*, Vol. XXII., p. 110), this precise combination has fallen to my lot. In no other cases have I experienced three Cuckoos' eggs in one nest, nor two eggs from the same Cuckoo in one nest. In each of these three cases the Meadow-Pipit's nest contained two eggs of the Meadow-Pipit and also, curiously, each time the three Cuckoos' eggs have been the product of two Cuckoos. In the first instance I was able to establish with reasonable certainty that the Cuckoo which laid two eggs in the nest did so for want of another nest of the same species on her territory. In this connexion, it is significant that on the same date—June 11th, 1930—and within a short distance, O. R. Owen also found a nest of a Whinchat (*Saxicola r. rubetra*) containing six of its own and one Cuckoo's egg—a most unusual fosterer.

On May 31st, 1930, a Cuckoo laid an egg—for the second year in succession—in the nest of a Pied Wagtail (*Motacilla a. yarrellii*) on my house in Berkshire. The day before, when the Wagtail's nest contained one egg I surprised some friends by inviting them by telephone to "come and see a Cuckoo lay on my house to-morrow." The Cuckoo's previous

manœuvres encouraged this forecast, for on Monday, May 12th, at 8.30 o'clock in the morning, my wife called my attention to a male Cuckoo flying into the ivy under a bedroom window at the front of the house to exactly the spot where the same female Cuckoo laid in the Wagtail's nest last year. This incident led me immediately to examine this year's nest of the Wagtail, which I knew to be in the ivy on the other side of the front door, between that and the cloak-room window. I showed the nest to the gardener at midday, when it contained one young Wagtail, about three days' old, whereas a week previously it had contained three eggs well incubated. I have an open mind as to whether either the male or female Cuckoo had at this time even discovered the Wagtail's nest.

We decided the young Wagtail was too young to "ring." My wife and I went out in the afternoon, but upon our return to tea the gardener, who had been working near by, reported that at about 3.30 p.m., noticing a hubbub in an oak tree fifty yards from the house in full view of the nest, he looked up and saw a Cuckoo being mobbed by Chaffinches and other birds. In a few moments, to his amazement, the Cuckoo glided straight down into the ivy to the spot where I had shown him the nest at midday. My gardener says that the Cuckoo remained there for two or three minutes, and when she flew out she settled momentarily on a young cedar tree. He particularly noticed that she had nothing in her beak. He went to the Wagtail's nest and found it empty; after hunting the ivy down to the ground, he remains perfectly convinced that the Cuckoo ate the young Wagtail. It would be easy, however, to be mistaken in such a matter.

As soon as he reported the incident I told him that the Cuckoo obviously intended to lay in the "repeat" nest of this Wagtail.

The Wagtail was slow in rebuilding, but its new nest was just on the other side of the window and within two or three yards of that from which its young had been taken, but a much less easy site for the Cuckoo to observe. The female Cuckoo was noticed in an ash tree at the bottom of the garden, a long distance observation post, but the best under the circumstances. On Sunday, May 25th, and on Thursday, May 29th, she was so much in evidence that I then declared that if the Wagtail should begin to lay by Saturday, May 31st, in my opinion the Cuckoo would lay that day. My observations in Worcestershire from 1918 to 1922, reported fully in

British Birds and in *The Cuckoo's Secret*, had proved conclusively that a female Cuckoo takes especial interest in the particular nest in which she intends to lay forty-eight hours hence, following upon her initial observations during the process of nest-building on the part of her intended victims.

The behaviour of the male Cuckoo at 8.30 a.m. on May 12th, in conjunction with the fact that the Cuckoo's egg laid on May 31st is exactly similar to that found in the Wagtail's nest on the house about a week later last year, is confirmatory evidence of the fact that the same Cuckoos mate together from year to year, and continue to victimize the same individual fosterers. I am still of the opinion that Cuckoos, although they mate together like this, are in some measure promiscuous.

On May 21st this year a nest of a Dartford Warbler (*Sylvia u. dartfordiensis*) was found in the south of England, containing three eggs and a Cuckoo's egg. Again, on June 25th, in the same district, the same man in company with a well-known ornithologist, found a nest of a Corn-Bunting (*Emberiza c. calandra*) with three of its own eggs and one of a Cuckoo. I saw these two nests the following day and was interested to find that in both cases they were within easy reach of good observation posts for the Cuckoos. From the character of the surroundings, in both cases I should conclude that Meadow-Pipits were the intended victims of these Cuckoos, and had I been present on both occasions I should have expected to find such evidence. Of a great number of Dartford Warbler's nests which I have been privileged, through the courtesy of friends, to see within recent years, I have seen none so likely to be found by a Cuckoo hunting in the heather for a Meadow-Pipit's nest as this Dartford Warbler's nest, which contained a Cuckoo's egg.

One friend of mine has found more Cuckoo eggs this year than in any of the last ten years, a total of no less than 67 eggs, including a run of eighteen from a fifth-year Reed-Warbler Cuckoo, which laid seventeen eggs last year. I think that thirty-five Cuckoo's eggs in two consecutive seasons from the same Reed-Warbler Cuckoo is a record. The longest recorded series by a Reed-Warbler Cuckoo in any one season—nineteen in the year 1921—is also in my collection.

My own self-taken series of twenty-one in the year 1920 and twenty-five in the year 1922, in both cases from the Meadow-Pipit Cuckoo of Cuckoo film fame, are the only recorded instances of a Cuckoo laying as many as twenty eggs in a season.

NOTES

JAYS KILLING FULLY-GROWN YOUNG OF SONG-THRUSH.

ON July 5th, 1930, I was photographing in Monmouthshire some Song-Thrushes (*Turdus ph. clarkei*) from a hide. The old birds were feeding fully-grown young ones, when two Jays (*Garrulus g. rufitergum*) attacked the nest. One of the young ones was killed and another was carried away by the Jays, which took no notice of the old Song-Thrushes, whose endeavours to defend their young were in vain. T. R. TALLIS.

HAWFINCH BUILDING THREE NESTS IN A SEASON.

IN a garden at Woodford Green, Essex, last year (1929), a pair of Hawfinches (*Coccothraustes c. coccothraustes*) built a nest in an open position on the leafless branch of an apple tree. The nest was first noticed on April 10th, when about half finished, and was added to from time to time for the next two or three weeks. A quantity of twigs and rootlets was dropped to the path beneath. The nest was not examined or disturbed, but no eggs were laid, and in the middle of May another nest was built in a pear tree 15 yards away. It was well concealed and no material was dropped from this nest. Two eggs were laid, and one young was hatched, which flew on June 6th. On June 10th a third nest was commenced 20 yards from the last, also very well concealed, and with a very small quantity of dropped material. The three eggs were destroyed, very probably by a Jay.

In the previous season much the same procedure in building was gone through. A first nest was started before the leaves were on the trees, in an easily seen position, and betrayed by a quantity of dropped material. It was deserted after the leaves appeared, and another nest built and used in a well-hidden position.

C. L. COLLENETTE

CHAFFINCHES CAUGHT IN NEST-LINING.

Two incidents suggestive of a heavy mortality among nestlings of the Chaffinch (*Fringilla c. caelebs*) were impressed on us recently.

On June 25th, 1930, near Whalley (Lancs.), an unusual demonstration by a male Chaffinch caused us to investigate the thorn hedge from which the bird had flown, where we

found a fully-feathered young bird hanging head downwards, our advent having scared it into leaving the nest. The foot was entangled with nest-lining—horse-hair and wool. I caught the bird, and after clearing the foot of the wool, etc.—with which it was matted—we finally liberated it. It flew strongly, and alighted in a tree about seventy yards distant. The remainder of the brood must have left the nest some time previously, and the unfortunate captive had in the meantime been fed, apparently, by the male parent. Three days later, E. Battersby encountered a somewhat similar state of affairs within two miles of the first nest. In this case the bird was dead, but was hanging head downwards in precisely the same way. Both these nests were lined with cow-hair, horse-hair, and a little wool.

CLIFFORD OAKES.

EDMUND BATTERSBY.

HOUSE-SPARROWS EJECTING MARTINS.

HAVING had occasion to destroy the nest of a pair of House-Sparrows (*Passer d. domesticus*) which had been built in a gutter on my house (at Kelling, Norfolk) and which contained two eggs, I was surprised to find that, in order to provide a new home at short notice, the birds attacked the nest of a pair of House-Martins (*Delichon u. urbica*) which were then feeding three half-fledged young. This nest was about 15 feet away. The Sparrow's nest was destroyed on the evening of July 14th, and on the evening of July 15th, on my return home, one of the Martins swooped down close to my head (a trick this species has when one of its young falls from the nest) and, sure enough, a young bird was found lying dead on the ground. Next morning my wife saw another fall from the nest, and at the same moment a Sparrow flew away. I then found the two other young, one dead, the other still alive. Wishing to see exactly what happened, I replaced the live bird and hid in an outhouse whence I could watch proceedings unseen. The time was then 10 a.m. Within ten minutes both Martins returned and one remained in the nest. At 10.18 the cock Sparrow entered and dragged out the parent Martin by the neck, both birds falling almost to the ground before separating. The hen Sparrow then entered, but two minutes later came out and the cock went in for a few moments only. At 10.30 one Martin returned and worked at the entrance hole, probably trying to make it

smaller, and afterwards went into the nest. Five minutes later the hen Sparrow entered and drove out the parent Martin, hanging on to its tail or wing as it struggled out. At 10.48 the cock Sparrow entered and the hen came out, followed a moment later by the cock dragging out the young Martin, which this time fell dead to the ground. The young birds showed signs of having been pecked on the head, and I believe the last one was finally killed in the nest before being ejected. The Sparrows have thus gained a home for their eggs and I hesitate to molest them lest they attack one of my other nests, now just hatching. R. M. GARNETT.

FLY-CATCHING ACTION OF SKY-LARK.

ON June 11th, 1930, when staying at Katwick, on the Dutch coast, I noted a curious action on the part of three Sky-Larks (*Alauda a. arvensis*). Over a broad ditch at the corner of a pasture field a cloud of gnats was dancing about 15 feet in the air. Presently a Sky-Lark flew into the midst of them and began hovering like a Kestrel. I moved up within 15 yards and could distinctly hear the snapping of the mandibles as it caught the gnats. Two other Sky-Larks flew up and joined company in the Kestrel-like hovering, and in the audible snapping of the bill. After a very short feed they flew down to earth. I noticed a pair of Crested Lark (*Galerida cristata*) close by, but they took no part in the gnat-catching.

WILLIAM SERLE.

LARGE BROOD OF PIED WAGTAILS.

ON June 14th, 1930, Mr. J. Vincent and I found a Pied Wagtail's (*Motacilla alba yarrellii*) nest in marram grass in the sand-dunes at Waxham, Norfolk. It contained seven newly hatched young, two fertile eggs and two clear eggs.

The *Practical Handbook* records "clutches of 9 to 11, probably by two hens", and no doubt this clutch of eleven was a similar case; however, we saw one male and one female only visiting the nest and feeding the young. A. W. BOYD.

[The statement in the *Practical Handbook* was based on nine recorded instances of ten to eleven eggs. In three of these cases there was evidence that two hens had taken part, and in one instance the two females were sitting side by side in the same nest. See also notes on this subject in *B.B.*, Vol. XXIII., p. 127.—F. C. R. JOURDAIN.]

NUTHATCH IN PEMBROKESHIRE.

WITH reference to Mr. Fincher's note (*antea*, p. 75), the statement in the *Practical Handbook* (1919-20) that the Nuthatch is "very rare in western Wales" stands in need of revision.

In Pembrokeshire, the westernmost county of the Principality, Mr. Charles Oldham and I have noted this species in winter and summer in at least a dozen localities. Though much of this county consists of treeless tillage and moorland quite unsuited to the Nuthatch, we have during the last seven years seen a good many nests and young broods in various parts, ranging from the northern to the southern boundaries; and in some of the wooded districts about Milford Haven this species is a fairly well distributed resident.

BERTRAM LLOYD.

ADULT WILLOW-WARBLER KILLED BY RED-BACKED SHRIKE.

AT Benacre, Suffolk, on July 8th, 1930, I found an adult Willow-Warbler (*Phylloscopus t. trochilus*) killed by a Red-backed Shrike (*Lanius c. collurio*). The bird was hanging on a broken twig of an elder, which pierced the neck. It was quite fresh and undamaged except for the skull, which was cracked open and picked bare.

F. STAUNTON.

[Mr. J. H. Owen has found Willow-Warblers and Common Whitethroats the most frequent victims among the many small birds killed by this species, *cf.* Vol. XXIII., p. 95.—EDS.]

RING-OUZEL IN KENT IN JULY.

ON July 27th, 1930, a bird was brought to me by the farm bailiff of a local farmer to identify. It was an adult male Ring-Ouzel (*Turdus t. torquatus*) in good condition. The Ring-Ouzel has occurred before in the parish of Boxley, but on the spring migration; there are two in the Maidstone Museum, one shot in Boxley in the month of May, but I can find no record of one occurring in July in Kent.

JAMES R. HALE.

BLACK REDSTARTS IN PEMBROKESHIRE.

THERE was a fair arrival of Black Redstarts (*Phœnicurus o. gibraltariensis*) on the island of Skokholm this spring, as the following records show. As the adult female is rather

difficult to distinguish from the first year male, I have only noted the sex of full-plumage males. March 5th, 1930, two; 13th, a male; 22nd and 23rd, two males; 25th (this on Skomer Island), one; 26th, 27th and 29th, one; 30th, at least two, probably four; 31st, one; April 2nd, two; 6th, one.

The occurrence of a male on Skokholm on April 28th, 1929, should be added to those already recorded for that year (*antea*, Vol. XXII., p. 373). R. M. LOCKLEY.

MORTALITY AMONGST SWIFTS CAUSED BY COLD.

A BIG southerly movement of Swifts (*Apus a. apus*) usually occurs along the Suffolk coast at the end of the third week of July. This year (1930) the drift was at its height on the afternoon of July 21st, a day of heavy squalls of rain and wind from S.S.W. with a temperature low for the time of year. There was a further drop in the temperature during the night. Next morning a lady living in Aldeburgh told me that her garden was "full of dead and dying Swifts." On going there I saw about thirty Swifts massed and clinging to the outside wall of the house under the eaves. On the ground many birds were lying dead or helpless. We collected the survivors and placed them in baskets in a warm room. In a few hours most of these recovered and were turned out. From similar reports from other sources it is evident that Swifts suffered heavily throughout this district. The birds I handled were all adults. J. B. WATSON.

[Very similar occurrences are referred to in *A History of the Birds of Kent*, p. 225.—EDS.]

YOUNG KESTRELS KILLING SMALLEST OF BROOD.

ON May 24th, 1930, I found a Kestrel (*Falco t. tinnunculus*) in Breconshire, sitting on five eggs, and on June 14th all the eggs had hatched. On June 21st I spent a considerable time in a hide photographing the Kestrels; there were four strong young ones and one weakling in the nest, and the strong ones were pecking vigorously at the weakling and obviously trying to tear it up and eat it, but they were, however, not quite strong enough to do this.

On June 28th the weakling had disappeared and had apparently been eaten. I saw the following food brought to the nest; several mice, a young Greenfinch and a lizard.

T. R. TALLIS.

GADWALL IN KENT.

ON April 21st, 1930, I identified a pair of Gadwall (*Anas strepera*) amongst a crowd of other ducks on one of the Romney Marsh Fleets. When I next visited the locality on the 30th I was unable to find them, and they had presumably passed on. During the last thirty years or more I have visited these Fleets several times each spring and this is the first time I have met with Gadwall there and the species still remains an unaccountably rare visitor to Kent. The only additional occurrences that have come to my notice since the publication of my *History of the Birds of Kent* are an adult male shot at Darenth on January 7th, 1881, and a pair shot at flight near Appledore in January, 1928.

N. F. TICEHURST.

BREEDING STATUS OF THE GARGANEY IN ESSEX.

IN his *History of the Birds of Essex* Mr. W. E. Glegg sums up the status of the Garganey (*Anas querquedula*) as an "uncommon summer visitor to Essex, where it has bred on several occasions." I think it should be described as an uncommon but regular breeding species in the county, and I believe that it has nested regularly since 1912. I am quite convinced that the species is well distributed throughout the county, but the nest is very difficult to find.

Additional to the information regarding nesting given by Mr. Glegg I have the following notes:—

In 1912 there were two or three pairs on the Thames Marshes and at least that number have been present every summer since, though the number now is probably five or six pairs.

In 1920 a pair again bred on the Crouch, where a brood was reared in 1896 as recorded by Mr. Glegg (p. 177).

In 1921 and 1922 two pairs bred on some marshes south of the Crouch. They returned in 1923, but the fleet had become brackish and I believe the birds settled not very far away.

On May 14th, 1922, I flushed a drake Garganey and saw another pair on the marsh in which Mr. Glegg records a pair seen by Colonel Sparrow in 1925. The keeper had confused the birds with the Teal, so it is quite probable that they bred here prior to 1922. They certainly have done so every season since.

On the Blackwater the Garganey bred in 1923 and has done so every year since.

This year (1930) I have found two pairs breeding still further to the north of the county. Here again the keeper had mistaken the birds for Teal.

It is quite possible one or two of these records are included in Mr. Glegg's book, but without any details so that one cannot be certain.

P. M. MEESON.

RINGED PLOVER'S DOUBLE BROOD.

ON April 27th, 1930, in a rough bit of land beside a forest in east Suffolk, I saw a Ringed Plover's (*Charadrius h. hiaticula*) nest with four eggs, on which the bird was sitting. These eggs hatched out successfully. In the same patch of ground, on July 19th, I saw a nest with the eggs just chipping. This must have been a second brood, as no other pair of Ringed Plovers frequented that area.

T. G. POWELL.

[Mr. J. K. Stanford has already shown (Vol. XXI., p. 77) that Ringed Plovers are usually double-brooded in Suffolk, but this appears to be a particularly clear example owing to the absence of other birds in the locality concerned.—EDS.]

MELANIC NESTLINGS OF THE LAPWING.

ON May 31st, 1930, in the hilly country a few miles south of Macclesfield, Cheshire, I found a brood of four young Lapwings (*Vanellus vanellus*); two of these were normal, but the other two appeared at first sight to be quite black, like young Moorhens.

On examination it was seen that the usual mottled brown colour was replaced with black, except that there were tinges of brown at the tips of the downy feathers; the nape was a dull white, much darker than that of a normal chick, and the belly was white.

The general appearance of the two black youngsters was most remarkable, particularly when in company with the normal birds.

A. W. BOYD.

THE ROOK IN LANARKSHIRE, 1922-29.—Under this title Mr. Walter Stewart gives the results of a census of nests of the Rook (*Corvus f. frugilegus*) in Lanarkshire, taken in 1929, and compares the figures for each rookery with those obtained in a similar census in 1922. Taking the county as a whole, the nests have increased from about 18,800 in 1922 to 23,800 in 1929. This increase is, however, mainly due to one small area in the south-east of the county, where the nests have increased from 2,800 to over 6,000. In one of the largest of

these rookeries great numbers of birds have been shot in endeavours to decrease them, yet their number has more than doubled. Those interested should refer to the full results given in *The Scottish Naturalist*, 1930, pp. 15-21, and for the 1922 census, 1923, pp. 141-6.

IMMIGRATION OF CROSSBILLS. There are indications that last year's immigration of *Loxia curvirostra* is being repeated this year and several reports of birds seen have already been received. Since, however, certain of the 1929 migrants appear to have remained in different parts of the country over the winter, it is desirable that correspondents should state so far as they are able whether any birds have been seen prior to July, 1930, in localities whence any fresh records are sent in.

BIRDS IN SKYE.—As a result of a short visit paid to Skye by Misses L. J. Rintoul and E. V. Baxter in May and June, 1930, some interesting additions were made to the island list (*Scot. Nat.*, 1930, pp. 85-7). Chief among them were: Greenfinch, some proved to breed; Tree-Pipit, males singing in two localities; Wood-Warbler heard singing in two places; Redstart, one seen; Tufted Duck, a pair "obviously breeding"; Eider, greatly increased.

CONTINENTAL BLUE TIT IN SHETLAND.—Mr. W. L. McDougall records (*Scot. Nat.*, 1930, p. 22) that he found a Blue Tit in a conservatory at Sumburgh House on January 11th, 1930. The bird has been examined and proves to be of the typical race, *Parus c. cæruleus*, and is a male measuring 67 mm. in the wing. Single birds of this form have previously been identified in Peebleshire, Fair Isle and Norfolk.

ROLLER IN MULL.—Dr. J. Ritchie records that a *Coracias g. garrulus*, shot in Mull on September 10th, 1927, has been presented to the Royal Scottish Museum.

HOBBY IN SUTHERLAND.—Mr. F. S. Beveridge states (*Scot. Nat.*, 1930, p. 22) that he saw a Hobby (*Falco subbuteo*) at Scourie on August 12th-13th, 1929. The bird appeared to be very tired.

PINK-FOOTED GOOSE IN SHETLAND.—Although the Pink-footed Goose (*Anser brachyrhynchus*) has visited Fair Isle, it had not been identified in Shetland. Mr. G. W. Russell writes (*Scot. Nat.*, 1930, p. 68) that it occurs there and he has

sent the head, wing and foot of one shot near Lerwick on October 21st, 1929, to the Royal Scottish Museum, which have been identified as belonging to this species.

BREEDING OF GOOSANDER IN SELKIRKSHIRE.—Mr. G. R. Millar records (*Scot. Nat.*, 1930, p. 87) that three or four pairs of *Mergus merganser* bred in 1930 on the River Ettrick. Eggs and down have been identified by the authorities of the Royal Scottish Museum. The Goosander had not before been recorded as breeding south of the Forth.

LETTERS.

"NIGHT SOARING OF SWIFTS."

To the Editor of BRITISH BIRDS.

SIRS,—I quite agree with Mr. James J. Cash (*antea*, p. 88) that Swifts (*Apus a. apus*) do return to their nesting and roosting quarters after their occasional high vesper flights. About thirty years ago, on several occasions, I investigated this matter, and recorded my observations in *The Naturalist* so long ago as 1907 (p. 113) and I have several times confirmed them since. I was favourably situated for watching a particular colony, and on certain clear bright evenings (usually in June) when I saw the birds (males, I believe them to be) mounting in large circles just before dusk, I would take up my stand on a hill that stood behind the buildings in which several pairs nested and roosted. I used a pair of "sea and night" binoculars which were very good for evening work, or even for light nights. I watched the birds as long as possible, and never saw any signs of descent. But as soon as they were completely lost to view I made my way quickly to just below, where they nested, a matter of only a few minutes. In about a quarter of an hour later I could distinctly hear the flutterings of the returning birds above me in the darkness, and sometimes a bird appeared to have a little difficulty in finding its exact quarters. Although they appeared to return singly, yet there was but little time between the first flutter and the last. I have since noticed that such evenings when Swifts take these curious vesper flights are followed by dark nights. Occasionally at that season of the year we have a night or two when it does not really get dark at all, or not until after 1 or 2 a.m., when I have given up the hunt. On several such evenings I have turned out to observe Swifts and certain bats. But the Swifts went to bed, and the bats stayed at home!

H. B. BOOTH.

BEN RHYDDING, YORKS.

RETURN OF CUCKOO TO SAME TERRITORY IN SUCCESSIVE SEASONS.

To the Editors of BRITISH BIRDS.

SIRS,—Mr. Gordon Clark's letter (*antea*, p. 88), reporting a male Cuckoo's (*Cuculus c. canorus*) return for twelve seasons, is very interesting to me.

As yet, in my careful examination of this problem, nine seasons is the limit which any Cuckoo has reached in returning to lay—always on the same area, though expanded or contracted according to the competition in the laying territory with which she has to contend.

If it would be of interest, I should be pleased, when time permits, to tabulate the results of my investigations into this particular problem. In the meantime, the experience of careful observers would be most interesting.

I am personally of the opinion that females also tend to return year after year to the same territory, in the breeding-season, just as constantly as males.

This conclusion naturally leads on to the belief that birds frequently—and in my opinion probably for preference—select the same mates season after season. I am inclined to think in many cases they are companions all the year round.

I would not narrow this conclusion to birds, but should not be surprised, if one could be authoritatively informed, that everything in Nature tends to establish for itself its own beat or home. I refer principally to the breeding-season. My egg collection demonstrates almost countless occasions when in successive seasons the same female has been laying on the same territory. For instance, I have reliable proof that a Meadow-Pipit (*Anthus pratensis*) has laid during each of the last four seasons on the same territory.

An interesting problem is what becomes of the young in the following breeding-season; and, when father or mother dies, is it often a descendant that takes his or her place?

BULWELL, BURCHETTS GREEN, BERKS.

EDGAR P. CHANCE.

August 8th, 1930.

DELAYED LAYING OF A LAPWING.

To the Editors of BRITISH BIRDS.

SIRS,—On March 22nd, 1930, one of a number of Lapwings' (*Vanellus vanellus*) nests which I found in Berkshire contained two eggs of an unusual type. I replaced these eggs with two ordinary eggs, and I visited the nest again on March 29th expecting to find a clutch of four had been completed. As the weather in the meantime had been quite normal, I was surprised to find the bird apparently sitting upon the two eggs which I had left in the nest a week ago, for the same two eggs were there which I had marked and they were warm. I therefore gave the bird two more eggs upon which to sit, making four in all.

When visiting the ground again on April 1st, I was surprised to find the bird sitting on five eggs, the extra egg being quite obviously the third egg of the bird's own clutch. This I removed, and on Saturday, April 5th, found the Lapwing had laid her fourth egg.

This interval of over a week between the laying of the second and third egg is surely quite unusual in normal weather circumstances.

BULWELL, BURCHETTS GREEN, BERKS.

EDGAR P. CHANCE.

August 8th, 1930.

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NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U.

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A NORTH SEA BIRD LOG. 1928-1929.

BY

CAPTAIN D. K. WOLFE MURRAY, F.Z.S.

THE following observations of migrants were made at sea with the fishing fleets during the periods January–October, 1928, and May–December, 1929. (For chart of area see p. 120.)

Birds are only recorded in cases where identification was sure, except in the cases of the Shearwater, September, 1928, and Owl, October, 1928; in each case the most likely species is given.

No notice was taken of even first-hand reports, as the descriptions were so varied that it was utterly useless to try and identify a bird from them.

Birds were observed only during daylight hours; doubtless many rested on the ship during the darkness, but were unobserved.

The direction of travel is only given in those cases where birds could be watched until definitely out of sight. In the main, arrivals came up wind to the ship, and, on being disturbed, departed to some other trawler near and so were lost sight of.

It may, perhaps, be worth while to draw special attention to the records of the Hedge-Sparrows, April 1st, 1928; Alpine Accentor, May 17th, 1928; Crossbills, June 27th, 1929; the four Sparrow-Hawks in September and October, 1929, and the Little Stint on December 25th, 1929.

Date	Species	No.	Lat.(N.)	Long.(E.)	Wind and Force	Visibility
1928. JANUARY.						
15th	Starling (<i>S. vulgaris</i>)	8	55° 00'	4° 10'	N.W. fresh	Mod.
FEBRUARY.						
26th	Sky-Lark (<i>A. arvensis</i>)	1	55° 05'	4° 20'	S.S.E. light	Bad.
MARCH.						
2nd	Sky-Lark ...	2	54° 45'	5° 00'	S.E. light	Mod.
3rd	Sky-Lark ...	2	54° 15'	4° 00'	E. light	Good.
	Lapwing (<i>V. vanellus</i>)	1				
	Carriion-Crow (<i>C. c. corone</i>)	1				
4th	Starling ...	3	54° 45'	4° 40'	S.E. light	Low.
	Sky-Lark ...	1				
	Blackbird (<i>T. merula</i>)	1				

Date	Species	No.	Lat.(N.)	Long.(E.)	Wind and Force	Visibility
MARCH— <i>continued.</i>						
5th	Starling ...	4	54° 40'	4° 45'	S.E. light	Low.
6th	Hooded Crow (<i>C. cornix</i>)	1	54° 55'	4° 50'	S.S.E. light	Fog.
	Starling ...	6				
7th	Meadow-Pipit (<i>A. pratensis</i>)	2	54° 55'	4° 50'	Variable	Good.
	Starling ...	9				
	Sky-Lark ...	1				
	Hooded Crow...	1				
	Jackdaw (<i>C. monedula</i>)	1				
18th	Starling ...	2	54° 40'	4° 10'	S.E. strong	Low.
	Lapwing ...	1				
	Chaffinch (<i>F. cælebs</i>)	1				
31st	Starling ...	10	55° 55'	5° 30'	S.S.W. light	Mod.
	Redwing (<i>T. musicus</i>)	1				
	Chaffinch ...	4				
APRIL.						
1st	Robin (<i>E. rubecula</i>)	2	55° 50'	5° 40'	N. by E. mod.	Low.
	Rook (<i>C. frugilegus</i>)	1				
	Chaffinch ...	2				
	Jackdaw ...	1				
	Hooded Crow...	1				
	Meadow-Pipit	1				
	Sky-Lark ...	1				
	Starling ...	26				
	Blackbird ...	1				
	Hedge-Sparrow (<i>P. modularis</i>)	2				
	Linnet (<i>C. cannabina</i>)	2				
	Brambling (<i>F.</i> <i>montifringilla</i>)	1				
2nd	Robin ...	6	56° 00'	5° 50'	N.N.E. light	Low.
	Starling ...	14				
	Blackbird ...	1				
3rd	Starling ...	1	56° 10'	5° 30'	S.W. by S. strong.	Low.
4th	Starling ...	1				
5th	Starling ...	1	56° 5'	5° 30'	S.W. by S. light	Good.
6th	Meadow-Pipit	1	56° 15'	5° 40'	S.S.W. light	Mod.
7th	Robin ...	2	56° 00'	5° 30'	S. by W. light	Low.
	Meadow-Pipit	1				
9th	Chaffinch ...	1	56° 10'	5° 20'	S. by E. light	Mod.
	Meadow-Pipit	1				
10th	Chaffinch ...	1	56° 20'	5° 30'	S. by E. light	Mod.
	Brambling ...	1				

Date	Species	No.	Lat.(N.)	Long.(E.)	Wind and Force	Visibility
APRIL—continued.						
12th	Common Snipe (<i>C. gallinago</i>)	1	56° 20'	5° 35'	E. by N. strong	Low.
	Starling ...	1				
	Brambling ...	3				
19th	Meadow-Pipit	1	54° 50'	6° 00'	N.E. light	Good.
21st	Chaffinch ...	1	54° 30'	6° 05'	E. light	Good.
MAY.						
2nd	Meadow-Pipit	1				
	Chiffchaff (<i>P. collybita</i>)	1	55° 10'	3° 40'	S.W. mod.	Mod.
3rd	Song-Thrush (<i>T. philomelus</i>)	1	58° 15'	1° 40'	E. by S. mod.	Good.
4th	Redstart (<i>P. phænicurus</i>)	2	59° 5'	1° 40'	E.S.E. light	Good.
	Willow-Warbler (<i>P. trochilus</i>)	1				
	Fieldfare (<i>T. pilaris</i>)	1				
	Sky-Lark ...	1				
	Chaffinch ...	1				
	Meadow-Pipit	1				
5th	Wheatear (<i>Æ. ænanthe</i>)	1	Position as above.			Fog.
	Redstart ...	2				
	Fieldfare ...	1				
6th	Fieldfare ...	2	59° 15'	1° 35'	N. by E. light	Good.
	Meadow-Pipit	1				
	Redwing ...	1				
	(¹)Dunlin (<i>C. alpina</i>)	1				
	Hooded Crow...	1				
	Shag (<i>Ph. aristotelis</i>)	1				
13th	Carriion-Crow	1	57° 55'	1° 50'	W. light	Good.
	(²)Geese (<i>Anser</i> sp. ?)	18				
17th	Whinchat (<i>S. rubetra</i>)	1	57° 25'	4° 00'	E. light	Mod.
	Redstart ...	2				
	Pied Flycatcher (<i>M. hypoleuca</i>)	1				
	Alpine Accentor (<i>P. collaris</i>)	1				
JUNE.						
8th	Turtle-Dove (<i>S. turtur</i>)	1	—	—	—	—
	Blue-headed Wagtail (<i>M. flava</i>)	1	55° 45'	6° 50'	N.W. mod.	Poor.

(¹) Dunlin in full breeding dress.

(²) Flying E. very high.

Date	Species	No.	Lat.(N.)	Long.(E.)	Wind and Force	Visibility
JUNE—continued.						
9th	Swallow (<i>H. rustica</i>)	1	—	—	—	—
	Turtle-Dove ...	1	56° 5'	5° 10'	W. strong	Low.
10th	House-Martin (<i>D. urbica</i>)	1	56° 25'	3° 30'	S.W. strong	Mod.
11th	Nightjar (<i>C. europæus</i>)	1	56° 30'	3° 30'	S.W. mod.	Mod.
13th	Turtle-Dove ...	1	55° 30'	5° 30'	Var. light	Low.
14th	Redshank (<i>T. totanus</i>)	1	55° 15'	5° 30'	E. strong	Low.
JULY.						
6th ⁽¹⁾	Starling ...	1	54° 50'	5° 30'	W. by S. mod.	Mod.
10th	Starling ...	1	54° 55'	4° 50'	W. mod.	Mod.
AUGUST.						
2nd ⁽²⁾	Little Gull (<i>L. minutus</i>)	1	54° 50'	4° 20'	N.W. mod.	Good.
4th	Corncrake (<i>C. crex</i>)	1	55° 15'	4° 10'	Nil	Good.
10th ⁽³⁾	White Wagtail (<i>M. a. alba</i>)	1	55° 20'	5° 10'	W.N.W. strong	Good.
17th	Willow-Warbler	1	55° 30'	4° 30'	S.S.E. mod.	Good.
20th	Redstart ...	1	55° 5'	4° 10'	S. strong	Low.
	Golden Plover (<i>C. apricarius</i>)	40-50	—	—	—	—
21st	Swift (<i>A. apus</i>)	2	55° 00'	4° 25'	S.S.W. strong	Mod.
22nd	Whinchat ...	1	54° 50'	4° 15'	S.S.W. light	Low.
	White Wagtail	1				
	Chaffinch ...	1				
23rd	Redshank ...	1	55° 15'	4° 35'	S.S.W. light	Mod.
24th ⁽⁴⁾	Curlew (<i>N. arquata</i>)	5	55° 15'	4° 10'	S.W. light	Poor.
	Garden-Warbler (<i>S. borin</i>)	1				
	Pied Flycatcher	1				
26th	Common Snipe	1	55° 15'	4° 25'	S.W. mod.	Mod.
27th	Curlew... ...	2	55° 15'	4° 20'	S.W. mod.	Mod.
	Ringed Plover (<i>C. hiaticula</i>)	1				
	Willow-Warbler	1				
SEPTEMBER.						
27th ⁽⁵⁾	Shearwater ...	3	55° 25'	5° 00'	Nil	Good.
28th ⁽⁶⁾	Dunlin ...	1	55° 30'	5° 15'	N.E. mod.	Good.
OCTOBER.						
4th	Spotted Fly-catcher (<i>M. striata</i>)	1	55° 20'	4° 30'	Nil	Good.

(1) This year's bird in immature plumage.

(2) Immature bird.

(3) Immature.

(4) Curlew flying S.W. very low.

(5) Probably *Puffinus puffinus*.

(6) Assuming winter plumage.

(¹) This year's bird in immature plumage.

(²) Immature bird.

(³) Immature.

(⁴) Curlew flying S.W. very low.

(⁵) Probably *Puffinus puffinus*.

(⁶) Assuming winter plumage.

Date	Species	No.	Lat.(N.)	Long.(E.)	Wind and Force	Visibility
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OCTOBER—*continued*.

5th	Blackbird	...	I	55° 5'	4° 10'	S.W. light	Good.
6th	Starling	...	I	54° 55'	4° 20'	S.S.W. light	Low.
	(¹)Owl	...	I				
	Chaffinch	...	I				
Number of different species for 1928							

1929. MAY.

9th	Swallow ...	1	55° 10'	5° 50'	W.S.W. light	Mod.
	Meadow-Pipit ...	1	—	—	—	—
11th	Whitethroat (<i>S. communis</i>)	1	55° 30'	6° 50'	W. mod.	Low.
13th	Swallow ...	1	55° 55'	6° 50'	W. light	Low.
	Willow-Warbler...	1				
14th(²)	Golden Plover ...	200-300	55° 50'	6° 50'	S. mod.	Good.

JUNE.

9th	Common Sandpiper (<i>T. hypoleucos</i>)	1	55° 10'	5° 50'	S.W. light	Good.
10th	Turtle-Dove ...	1	55° 30'	5° 40'	S.by.W. light	Good.
27th	Crossbill (<i>L. curvirostra</i>)	2	54° 20'	4° 50'	N. light	Good.
29th	Mallard (<i>A. platyrhyncha</i>)	3	54° 30'	4° 45'	N.N.W. light	Good.

JULY.

21st	Dunlin ...	1	54° 20'	4° 30'	W. mod	Mod.
26th	Little Tern (<i>S. albifrons</i>)	1	54° 50'	4° 00'	S.W. strong	Mod.
	Great Skua (<i>S. skua</i>)	1				

AUGUST.

NIL.

SEPTEMBER.

9th	Wheatear ...	1	55° 00'	5° 10'	N. light	Good.
10th	Wheatear ...	1	55° 00'	5° 10'	N. light	Good.
12th	Whinchat ...	1	54° 50'	4° 40'	S. mod.	Good.
13th	Wheatear ...	1	55° 00'	4° 20'	S.S.W. light	Good.
14th	Dunlin ...	1	55° 00'	4° 40'	W. light	Low.
15th	Wheatear ...	2	55° 05'	5° 00'	S.W. light	Low.
	Willow-Warbler...	1				
16th	Redstart ...	7	55° 15'	4° 30'	E. light	Low.
	Wheatear ...	2				
	Willow-Warbler...	1				
	Starling ...	1				
	Spotted					
	Flycatcher ...	1				
	Sparrow-Hawk (<i>A. nisus</i>)	1				
	Turtle-Dove ...	1				
	Water-Rail (<i>R. aquaticus</i>)	1				

(¹) Probably *Asio flammeus*.(²) Flying high—N.N.W.

Date	Species	No.	Lat.(N.)	Long.(E.)	Wind and Force	Visibility
SEPTEMBER— <i>continued</i> .						
19th	Dunlin ...	1	55° 10'	4° 20'	E.S.E. light	Mod.
	Pied Flycatcher...	1				
	Robin ...	1				
	Starling ...	1				
18th	Dunlin ...	1	55° 10'	4° 30'	Nil	Low.
	Spotted Flycatcher ...	1				
	Sparrow-Hawk...	1				
	Redstart ...	1				
19th	Meadow-Pipit ...	1	54° 50'	4° 30'	W.N.W. strong	Good.
24th	Wheatear ...	1	55° 25'	4° 30'	S. light	Low.
25th	Redstart ...	3	53° 30'	4° 35'	S. light	Mod.
26th	Wheatear ...	1	55° 35'	4° 15'	S.W. light	Good.
OCTOBER.						
16th	Larks ...	100	55° 10'	4° 20'	S.W. mod.	Low.
	Starlings	50-60				
	Tree-Sparrow	5				
	(<i>P. montanus</i>)					
	Sparrow-Hawk...	1	No position taken being on passage from port.			
18th	Redwing ...	2	55° 10'	4° 20'	W. fresh	Good.
19th	Starling ...	4	55° 5'	4° 25'	S.W. light	Good.
	Redwing ...	3				
	Chaffinch ...	1				
20th	Sparrow-Hawk ...	1	55° 00'	4° 30'	W. fresh	Good.
	Starling ...	4				
	Chaffinch ...	1				
21st	Redwing ...	10	54° 00'	2° 15'	W. light	Good.
	Carrion-Crow ...	1				
	Starling ...	6				
	Chaffinch ...	4				
30th	Redwing ...	15	56° 00'	4° 40'	N. fresh	Good.
	Starling ...	6				
NOVEMBER.						
1st	Starling ...	100-150	55° 40'	4° 30'	Calm	Good.
	Golden-crested					
	Wren (<i>R. regulus</i>)	1				
2nd	Brambling ...	1	54° 45'	4° 20'	S.W. fresh.	Good.
	Starling ...	14				
3rd	Jackdaw ...	1	55° 35'	4° 10'	W. fresh	Mod.
	Starling ...	5				
4th	do. ...	10	55° 40'	4° 20'	S.W. gale	Mod.
6th	do. ...	4	55° 25'	4° 00'	W. mod.	Mod.
7th	do. ...	1	55° 30'	3° 40'	S.W. mod.	Good.
16th	do. ...	17	55° 10'	4° 10'	N.byW.light	Good.
DECEMBER.						
25th	Little Stint		54° 25'	3° 50'	S.W. gale	Mod.
	(<i>C. minuta</i>)	1				
	Dunlin ...	1				

Total species observed in 1929 ... 30

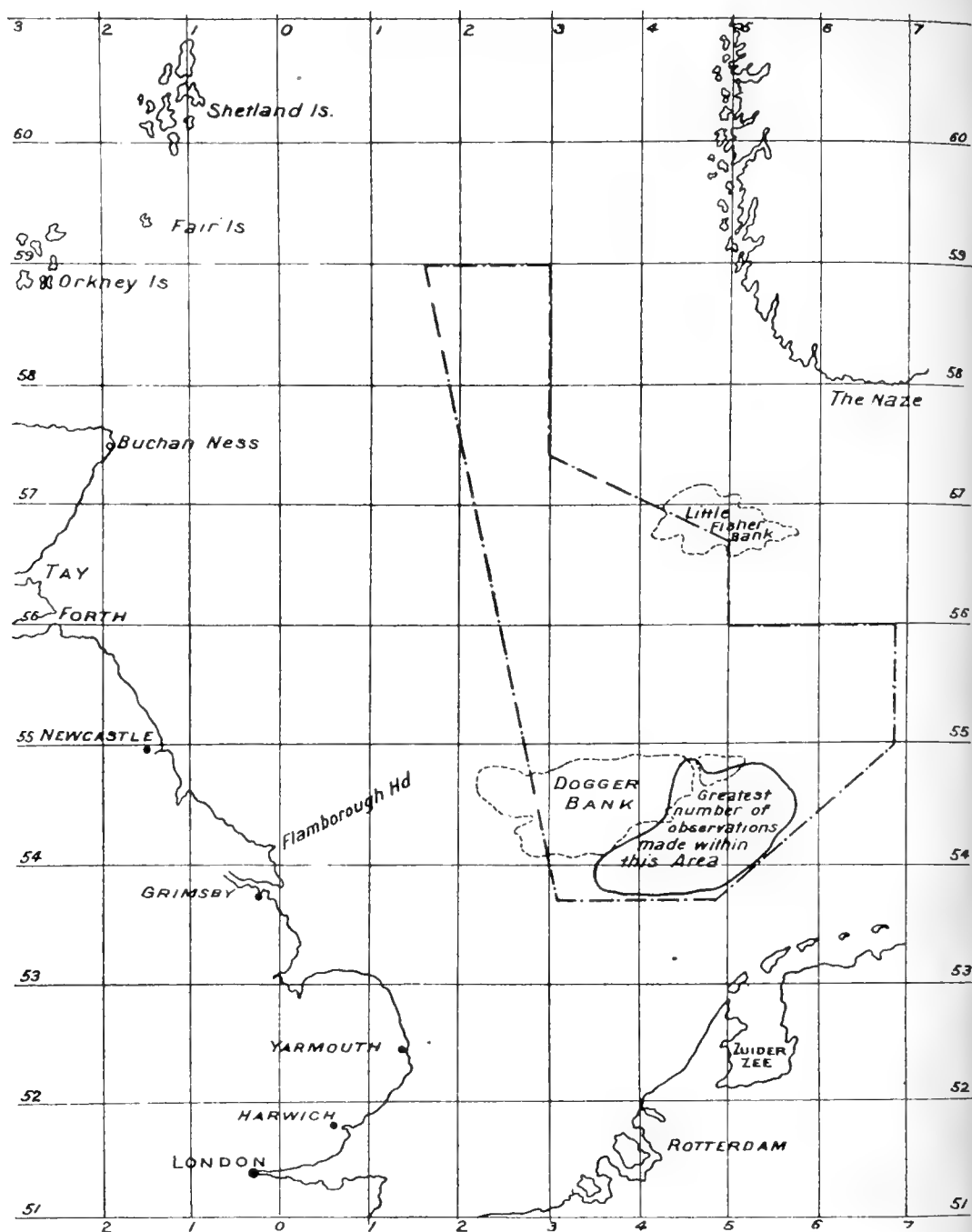


Chart to show the area over which the observations were made, *i.e.*, that enclosed by the broken line. The bulk of them, however, were made in the southern area of the Dogger Bank, enclosed by an unbroken line.

SOME FURTHER NOTES ON THE BIRDS OF BARDSEY ISLAND.

BY

W. WILSON.

THESE notes were made on two visits to Bardsey Island, one of three days at Easter by G. H. Emerson and his two brothers, and one from June 16th to June 25th, 1930, by G. H. Emerson and myself, and are supplementary to the paper by Dr. N. F. Ticehurst in Vol. XIII.

RAVEN (*Corvus c. corax*).—A pair nested near the Peregrine, the nest being built on a small ledge of a cliff a little way down from the top of the mountain. The young had flown by June, but three or four birds were frequently seen together.

CHOUGH (*Pyrrhocorax pyrrhocorax*).—In April two pairs were seen. The nesting-place of one pair was located and the birds seen near a partly built nest. In June the nest appeared to be finished, but no sight of the birds was obtained. The nest of the second pair was not located, but on several occasions the presence of a solitary bird seemed to indicate that the other was on the nest.

CORN-BUNTING (*Emberiza c. calandra*).—I only saw one and, although they were nesting in every field in 1913, it is impossible that we could have missed them, as we were through some of the fields at least once a day.

SKY-LARK (*Alauda a. arvensis*).—Not previously recorded. Several pairs were nesting in the cornfields near the landing-place.

COMMON WHITETHROAT (*Sylvia c. communis*).—A pair or two appear to have nested in some years, but none in 1913. We found them numerous in June, five or six pairs being located.

WHEATEAR (*Enanthe æ. ænanthe*).—Seen in April, and a nest with eggs found in June. This was the only nest that we could discover and no other birds were seen.

PEREGRINE FALCON (*Falco p. peregrinus*).—One pair nested on a ledge near the top of the mountain, on the east side. Four eggs were laid at the end of April; these were unfortunately taken and the birds left the island, only one being seen passing over in June.

KESTREL (*Falco t. tinnunculus*).—One bird frequented the mountain all the time we were there in June, but no sign of a nest was seen.

SHAG (*Phalacrocorax a. aristotelis*).—This bird has not previously been definitely recorded as breeding. We found

twenty pairs divided into three little colonies on the east side, All the nests contained young several weeks old, whilst on the neighbouring island we found several Cormorants' (*Ph. c. carbo*) nests with fresh eggs.

MANX SHEARWATER (*Puffinus p. puffinus*).—Although it is impossible to give an idea of the numbers, there must be thousands of them; they nest almost everywhere on the island, birds and eggs being found in rabbit holes by the lighthouse, and in holes in the walls dividing the fields, also on the island side of the mountain, but the seaward side is their chief stronghold and, in 1913, this was their only breeding-place, so that they have extended their range and numbers considerably.

Mr. Lockley (Vol. XXIII., p. 211) states that the red light of the Lighthouse on Skokholm does not attract them; the white one on Bardsey does, and many are killed at the lantern.

COMMON SNIPE (*Capella g. gallinago*).—A pair were seen and heard bleating in June and I think nest near a small stream in a rush-grown field. The lighthouse keepers say they do, but we did not find the nest.

GULLS.—They were nesting on the N.E. side of the island where the steep grass slope of the mountain ceases and it is rocky for about fifty feet to the water's edge. The vast majority were Herring-Gulls (*Larus argentatus*), there being only one pair of Lesser Black-backed Gulls (*Larus f. graellsii*) to about a hundred of the former. We never found a nest of the Lesser Black-backed among the Herring-Gulls, one or two pairs placing their nests apart on some separate rock. This species has not been recorded as having nested on the island before. I found four nests: two on one large rock and two on another about 100 yards away. In all cases I watched the birds on to the eggs. We have usually found them later than the Herring-Gulls, but here they all seemed to hatch together. About June 20th, whilst on a neighbouring island, we found eggs just chipping and the Herring-Gulls half-grown. We did not find the Great Black-backed Gull (*Larus marinus*) breeding on Bardsey, but several were seen and we found them nesting on a neighbouring island. In 1913 at least two pairs nested.

SOUTHERN PUFFIN (*Fratercula a. grabæ*).—It has been stated that the Puffin breeds on Bardsey. This was certainly not the case this year, not a single bird being seen. They nested in hundreds on Gull Island in Aberdaron Bay, two miles away.

LAND-RAIL (*Crex crex*).—Three or four pairs nesting. This appears to be half the number recorded in 1913.

The Pied Wagtail (*Motacilla a. yarrellii*), Sedge-Warbler (*Acrocephalus schoenobaenus*), Mistle-Thrush (*Turdus v. viscivorus*), Spotted Flycatcher (*Muscicapa s. striata*), Robin (*Erithacus r. melophilus*), Chaffinch (*Fringilla c. cælebs*) and Moorhen (*Gallinula ch. chloropus*) have all been recorded, all as single pairs in some years, with the exception of the Sedge-Warbler, of which about eight pairs nested in 1913. We did not find any of them, but we may have missed the Sedge-Warblers, as the little patches which they frequent were not thoroughly searched. Other birds seen were Carrion-Crow (*Corvus c. corone*), Jackdaw (*Colæus m. spermologus*), Starling (*Sturnus v. vulgaris*), Meadow-Pipit (*Anthus pratensis*), Rock Pipit (*A. s. petrosus*), Blackbird (*Turdus m. merula*), Hedge-Sparrow (*Prunella m. occidentalis*), Linnet (*Carduelis c. cannabina*), House-Sparrow (*Passer d. domesticus*), Wren (*Troglodytes t. troglodytes*), Stonechat (*Saxicola t. hibernans*), Swallow (*Hirundo r. rustica*), Swift (*Apus a. apus*), Cuckoo (*Cuculus c. canorus*), Common Heron (*Ardea cinerea*), Oyster-Catcher (*Hæmatopus o. ostralegus*), Lapwing (*Vanellus vanellus*), Redshank (*Tringa totanus*), Curlew (*Numenius a. arquata*), Razorbill (*Alca torda*) and Guillemot (*Uria aalge albionis*), but their status was found not to have altered since 1913.

NOTES

NOTICE TO RINGERS.

“RINGERS” are particularly requested to send in their schedules and lists of numbers of each species ringed without delay. These are not only required for the Annual Report, but as recovered birds are now being reported daily, much trouble will be avoided if the schedules are sent in promptly.—

H.F.W.

INCUBATION- AND FLEDGING-PERIODS OF SOME BRITISH BIRDS.

THE following incubation- and fledging-periods were obtained, ‘A’ in east Fife, and ‘B’ in the West Riding of Yorkshire in 1927, 1928, and 1930. The period of incubation has in each case been calculated from the day on which the last egg was laid until the day or days of hatching, and the fledging-period from then until the day or days of departure from the nest.

Species.	Incuba- tion- period in days.	Fledging- period in days.	Total in days.	Period of year of observa- tion.	No. of eggs in clutch.	No. of young to leave nest.
B LESSER REDPOLL (<i>C. l. cabaret</i>)	10	10-12	22	May-June	5	5
A YELLOW BUNTING (<i>E. c. citrinella</i>)	10	14	24	July-August	3	3
A do.*	... 12	10	22	August	4	2
A SONG-THRUSH (<i>T. ph. clarkei</i>)	13	—	—	March-April	4	—
A do.	... 14-15	—	—	April	3	—
A do.	... —	14-15	—	April-May	3	3
B do.	... —	12-14	—	May-June	6	5
B do.	... 13-14	13-14	27	May-June	4	4
B do.	... 13-14	11-12	25	June	4	4
A BLACKBIRD (<i>T. m. merula</i>)	14-15	—	—	April	4	—
A do.	... 14-17	—	—	April	3	—
A do.†	... 13	13	26	April	3	—
A DIPPER (<i>C. c. gularis</i>)	... 16-17	—	—	March-April	4	—
A STOCK-DOVE (<i>C. œnas</i>)	16-17	18-20	36	March-April	2	2
A JACKDAW (<i>C. m. spermologus</i>)	17-18	—	—	April-May	4	4
A STARLING (<i>S. v. vulgaris</i>)	12	—	—	April-May	6	—

(*) Nest begun seven days before first egg laid.

(†) Nest begun nine days before first egg laid.

W. J. EGGELING.

A. H. EGGELING.

NESTLINGS CAUGHT IN NEST-LINING.

WITH reference to the note by Messrs. Oakes and Battersby (*Ibis*, p. 103) three similar incidents of Chaffinches (*Fringilla cælebs*) being caught in nest-lining have come under my notice, but the percentage out of nests observed would not account for any heavy mortality, from this cause, in my district.

In 1929, I found two nearly fledged Hedge-Sparrows (*Prunella m. occidentalis*) dead in the nest. Both legs of the nestlings were hopelessly entangled among the materials. In the same year I found an adult Hedge-Sparrow hanging strangled by a long strand of black cotton that it was taking for lining.

In 1928, two young Song-Thrushes (*Turdus ph. clarkei*) died in the nest from their exertions to extricate their legs, that had penetrated the mud-lining and were interwoven among the dry grasses below.

In 1925, I released a fully-grown Greenfinch (*Chloris ch. chloris*) from a nest from which the other nestlings had long flown. The claws of one leg were protruding from the base of the nest and the leg was greatly swollen. The bird seemed healthy and flew strongly out of sight.

One might expect such occurrences to be frequent among Robins, since the nests are hair-lined, but I have no record of one.

B. H. RYVES.

CROSSBILLS EATING APPLES.

ON August 21st, 1930, in company with Mr. Packer, in his garden in the Barrows, Cheddar, I was very much interested in watching a pair of Crossbills (*Loxia c. curvirostra*) feeding upon apples. The tree was a small one, and laden very heavily with a small sort of apple, and the birds were tame enough to allow us to approach within a few yards. They fed only upon apples growing on the tree, and selected the smallest of the fruit. Portions of apples were continually falling, and the ground appeared as though strewn with "chewed up" apple. The upper-parts of the apples *only* were attacked, the basal halves being left *in situ* on the tree. The pips were extracted from every apple examined, and although we moved about beneath the tree for over half an hour the birds remained. Their actions were very parrot-like as they reached over with extended necks and split up the apple by apparently thrusting in the bill. Both birds were immature males.

STANLEY LEWIS.

[In connexion with the above we have received a letter from Mons. Georges Olivier of Elbeuf, in which he states that there is a considerable and widespread invasion of Crossbills (first noticed July 14th) in the departments of Seine Inférieure, Eure and Calvados, and also in Manche and Vendée. In the first three departments the Crossbills have been doing great damage in the apple orchards. As instances of this, Mons. Olivier states that in one orchard near him there were 70 kilogrammes of apples destroyed by the Crossbills and in another orchard to the north of Rouen 290 kilogrammes. All the apples so attacked which Mons. Olivier has examined have had the pips extracted.

Many years ago it was quite usual for Crossbills to attack apples during their visitations, and the bird was known in some districts as the "shell-apple", but in the 4th edition of Yarrell (1876-1882), Vol. 2, p. 191, Newton remarked in a footnote that "of late it has not often been observed feeding on apples, very possibly owing to the greatly increased growth of firs. . . In the days of its greatest depredations in orchards there could have been few, if any, conifers in England". We do not, in fact, know of any record of damage to apples since 1869.

We have received a few notes relating to this year's immigration of Crossbills, but we hope to receive more widespread information before publishing any account.—EDS.]

A PAIR OF WAGTAILS REARING TWO CUCKOOS IN ONE SEASON.

I HAVE this year, 1930, noticed an instance of a Pied Wagtail (*Motacilla a. yarrellii*) hatching out a Cuckoo (*Cuculus c. canorus*) twice in the same season. The first nest was built under some rock plants within a few feet of our house near Virginia Water. The young Wagtails were ejected and the Cuckoo reared by the Wagtails. The same pair of Wagtails built their second nest under the roof of a shed at the back of the house and have again brought up a Cuckoo. I regret that I kept no accurate notes of the occurrences at the time.

DOROTHY MICHOLLS.

SPOTTED FLYCATCHER'S NEST USED TWICE IN ONE YEAR BY DIFFERENT PAIRS.

ON June 1st, 1930, I found the nest of a Spotted Flycatcher (*Muscicapa s. striata*) in some ivy against a house at Woodford Green, Essex, and three young birds flew from it on or

about June 22nd. Subsequently, they were to be seen daily not far from the nest, and on July 11th I trapped and ringed both the parents.

In the third week of July I found a Flycatcher again sitting on four eggs in the nest, and noticed that she was unringed. Observation after the young were hatched showed that neither parent bore a ring. The two young birds, when nearly ready to fly, were found on August 6th dead below the nest, and the parents were not seen again. On this date the first family was still about the garden, and both marked birds were identified.

C. L. COLLENETTE.

REDSTARTS FEEDING UPON ELDERBERRIES.

WHILE watching a mixed party of migrants which were resting and feeding among some tall bushes in a sheltered hollow at Llanishen on August 24th, 1930, my attention was drawn to the behaviour of three Redstarts (*Phænicurus ph. phænicurus*), apparently all adult females, which were with them.

They were perched in a dead holly close to an elderbush, and at intervals would fly to the elder and hover with fluttering wings in front of it. With the aid of my field-glass I could plainly see them tugging at the bunches of elderberries and feeding upon the ripest.

Several other members of the party, Blackcaps (*Sylvia a. atricapilla*), Common Whitethroats (*S. c. communis*), Lesser Whitethroats (*S. c. curruca*), Willow-Warblers (*Phylloscopus t. trochilus*), two or three Whinchats (*Saxicola r. rubetra*), and three Spotted Flycatchers (*Muscicapa s. striata*) perched in the holly from time to time, but although they all visited the elderbush I only definitely saw a male Blackcap eat the berries.

The Redstarts and Flycatchers made constant sallies over the long grass to pick up some insect that had caught their eye, and I was interested to observe the very marked resemblance the two species bore to each other when so engaged. Both would dive off their perch to within an inch or two of the grass-tops, skim over them with a wavering, flickering flight, and hover over the spot where they had seen their prey and either pick it up while so doing or drop to earth for an instant to secure it, afterwards returning to the perch they had just left.

GEOFFREY C. S. INGRAM.

EVIDENCE FOR INDIVIDUAL CHANGES IN SWALLOW POPULATION.

IN 1929 I was successful in catching, during August, near

Laugharne, Carmarthen, six separate pairs of adult Swallows (*Hirundo r. rustica*) in small sheds or barns in which there was only one pair nesting. In August, 1930, I re-trapped these sheds, and the following is the result:—

Shed (A). No birds nesting in 1930.

Shed (B). A different female in 1930, but I did not catch the male.

Shed (C). A different pair in 1930.

Shed (D). A different pair in 1930.

Shed (E). Same male as in 1929, but a different female.

Shed (F). This shed was kept closed in 1930, but adjacent to it is another small shed, which was occupied by the same female as in 1929, with a different male.

The results are so meagre that comment is practically useless.

I now give some figures which seem to show that Swallows, when returning after their first winter abroad, scatter fairly widely over the district in which they were hatched. During the four years 1926–9 I ringed, near Laugharne, about 600 nestling Swallows, and in the four years 1927–30 I caught 52 adults; of these 52, only one had been ringed as a nestling. Corresponding figures for Wheatears (*Ænanthe æ. ænanthe*) suggest a much closer return to their birthplaces: during the five years 1922–6 I ringed near Seaford, Sussex, about 280 nestling Wheatears, and in the five years 1923–7 I caught 36 adults; of these 36, no fewer than 6 had been ringed as nestlings.

J. F. THOMAS.

SIZE OF SWALLOW BROODS IN CARMARTHENSHIRE DURING AUGUST.

BELOW are given figures showing the average size of broods of Swallows (*Hirundo r. rustica*) whose nests I have visited during August, 1930, in the neighbourhood of Laugharne. The years 1924–9 are also shown for comparison.

			No. of nests visited.	Average brood.	Percentage. Five or more.*
1924	...	...	24	3.96	29.2
1925	...	...	40	3.90	30.0
1926	...	...	45	4.04	26.7
1927	...	...	41	3.90	36.6
1928	...	...	32	3.34	6.2
1929	...	...	45	3.96	33.3
1930	...	...	36	4.06	36.1

* In 1930 for the first time I found a brood of six in August.

There is a remarkable constancy about the average brood, with the exception of the one bad year, 1928.

J. F. THOMAS.

SWALLOW'S UNUSUAL NESTING SITE.

IN *B.B.*, Vol. XVII., p. 109, I recorded a nest of a Swallow (*Hirundo r. rustica*) made without mud; this was inside the thatched roof of a shed.

On August 16th, 1930, near Laugharne, Carmarthenshire, I found a nest only 18 inches from the ground, in a crevice amongst a heap of some twenty stone slabs leaning against a wall. The nest, which was an untidy mass of hay and feathers, *without mud*, contained two dead young ones (age about sixteen days), while a third, alive, but rather weak, was perched just outside. The nest was inside a barn, where there were two other pairs nesting, and there seemed to be a good deal of discord among the adult Swallows there.

J. F. THOMAS.

SWIFT ROOSTING IN A TREE.

ON September 12th, 1930, a single Swift (*Apus a. apus*) flew to my island at Hickling, Norfolk, at 7.20 p.m. It circled round the willow-trees there three times, each time turning over in the air and making a noise with its wings much like that made by a Lapwing. Then it alighted on a very thin twig and immediately went to sleep. It was still asleep at 7.15 the next morning, but had gone by 7.45. I did not see it leave. On the 12th there was heavy rain most of the day and a strong N.E. wind.

E. L. TURNER.

GREEN WOODPECKER IN WEST ROSS-SHIRE.

ON June 26th, 1930, I was walking in a large pine-wood on the slope of a hill on the borders of Loch Duich in west Ross-shire, when I heard the "laugh" of a Green Woodpecker (*Picus viridis*). Then I caught a glimpse of it through the trees and heard it again twice. My friend, who was a little way off, also distinctly heard it.

As I believe there are very few records of this bird for the Highlands, it is perhaps as well to state that there are a great many Green Woodpeckers round my house in Norfolk, and consequently that I am very familiar with the bird.

M. BARCLAY.

[There have been several records of Green Woodpeckers in Perthshire in recent years and the bird is, no doubt, breeding

there in small numbers, but that one should be seen in June in west Ross-shire is very remarkable.—EDS.]

A FURTHER NOTE ON DOUBLE BROODING OF THE NIGHTJAR.

This summer (1930) I was able to observe the Nightjar (*Caprimulgus eu. europæus*) in the same locality as in previous years (*antea*, Vol. XXIII., pp. 242-5), and have to thank Messrs. R. M. Garnett and C. C. Lack for helping me to watch the nests. Three nests were found at which the male brooded the young when they were about twelve days old. The respective second-brood nests were found in two cases, and were one hundred and one hundred and sixty paces from their first nests. In one case, on the day that the male first brooded the young, the female was found roosting on the spot where she laid her first egg the next day. At the other nest there was also a day's interval between the male first brooding the chicks and the laying of the first egg of the second brood. In my original article I suggested that the female did not leave her first brood until ready to lay again, for this was what happened in captivity. But in the latter case the enforced proximity of the female to the first brood probably accounted for her brooding them an extra day; the young tried to creep under her even after she had laid. I also gave a possible case in the wild state of a female laying her first egg on the same day that she left her young. But here I was unable to watch in the evening to determine if the nests belonged to the same pair. The Nightjars in a given locality tend to lay at about the same time, so that it is not unlikely that two pairs were concerned in the last case.

The third nest found this year was exceptional. The male brooded the young at the expected time, and on the same and the following day the female was flushed about forty yards away. She evidently failed to lay, for after the two days she returned to the first brood, and for the next six days the male brooded one chick, the female the other. In this case the second nest would presumably have been only forty yards from the first. This is probably a more typical distance than the two others recorded above. In the latter there was a scarcity of suitable nesting sites, save in the immediate neighbourhood of the nests or rather far off.

At a fourth nest this year the young hatched on July 2nd and 4th. No second brood followed. At two nests in 1928 in which the young hatched in the first week of July there

was also no second brood. These nests were too early for second broods and seem too late for normal first broods. Probably they had been laid after destroyed first attempts. In my original article I gave an instance where such a late nest was followed by a second brood, but this is probably abnormal.

DAVID L. LACK.

GREENLAND FALCON IN INVERNESS-SHIRE.

IN the first week in April, 1930, at the head of the stream on the River Findhorn, the head-keepers of Glenkirk and Ballacrochan Moors saw a white Hawk with dark wing-tips, which was undoubtedly a Greenland Falcon (*Falco rusticolus candicans*). It was on a wire fence, and was either resting, or was attracted by a Black-backed Gull which was in a trap near by. There had been very heavy gales prior to the day on which it was seen. The keepers approached to within 100 yards, and left it unmolested. It then flew down the stream, flying like a Peregrine somewhat, and was not seen again. One of the keepers, L. Rose, had seen a similar Falcon more than twenty years ago and he is also acquainted with a stuffed specimen.

H. C. R. GILLMAN.

OSPREY IN CUMBERLAND.

I WAS at Keswick on August 31st, 1930, and saw what was undoubtedly an Osprey (*Pandion haliaetus*). It was fully a mile away from any considerable stretch of water, and made its way towards Skiddaw. Although I am not familiar with the bird, the white underparts, dark back and general build and flight made it unmistakable.

D. F. JORSON.

LITTLE EGRET IN DEVONSHIRE.

ON August 1st and 2nd, 1930, by the river Axe opposite to Axmouth, Devon, Mr. J. V. Worthington saw a small, white Heron, somewhat similar to the immature Buff-backed Heron which frequented the meadows near Axminster for so many weeks in June and July, 1930, and which was proved to be an escaped bird, but obviously distinguished from it by having black legs and a black and much longer beak. He took it to be a Little Egret (*Egretta garzetta*) and wrote to me to that effect.

The Rev. F. L. Blathwayt and I, together with Mr. Worthington, watched this bird for half an hour on August 7th, and we are completely satisfied that the identification is correct. The whole plumage was white, the legs long and

black, the beak long, pointed, and practically black. The crest was short and the plumes on the mantle were scanty, the wings broad and the flight rather heavy. We think the bird was either an adult in moult or immature. Also, from its restless and shy behaviour—flying up and down the river, or settling for a few moments in different places—we believe it to be a genuinely wild bird and not an “escape”. As to this latter possibility, my enquiries so far have met with a negative result.

This Little Egret, then, if acknowledged as a wild bird, is the second definite record for this country, and also for Devon, the only other admitted by the *Practical Handbook* as “thoroughly authentic”, having occurred near Exeter, Devon, on June 3rd, 1870. W. WALMESLEY WHITE.

[Unfortunately, it is difficult to accept as a genuinely wild example any record of such birds as Herons, Cranes and some of the rarer ducks. So many people keep these birds and either give them their liberty intentionally or allow them to escape, that it is becoming a frequent occurrence for such birds to be observed and recorded by ornithologists in the belief that they are wild. Moreover, birds are now imported and kept in such good condition that it is often impossible to judge by their appearance or actions whether they are wild or not. A notable example of this was a Flamingo which was observed to come down at Beaulieu, Hampshire, from a great height and acted in all respects as a very wild bird, being hunted unsuccessfully by gunners for a whole winter, yet this bird was shown to have escaped from captivity (*antea*, Vol. XX., pp. 156 and 228).—EDS.]

SIZE OF CLUTCHES IN SANDWICH TERN.

FOR several seasons I have visited an ever increasing Lancashire colony of Sandwich Terns (*Sterna s. sandvicensis*), but until this year I have not been able to count the clutches as the young were mostly hatched when I visited the place. The following numbers of ringed give an indication of the growth of the colony: 1920, 31; 1921, 30; 1922, 77; 1923, 64; 1924, 92; 1925, 117; 1926, 63; 1927, 120; 1928, 148; 1929, 399; 1930, 535 to date.

On June 1st, 1930, when the above-mentioned colony had young, another colony in the neighbourhood had only eggs. This colony was started last year with about fifteen nests, of which the greater number contained but one egg, but this year there were three of three, one hundred and eighteen

of two, and only forty with one egg. Others have been deposited since, even as late as July 2nd, when all the young in the old colony had flown.

The old colony, consisting of the main colony with three offshoots close to, is situated among Black-headed Gulls, the eggs of the two species being within a few inches of one another.

The new colony is situated on grassy and sandy patches on a gravel bed, with a small colony of Arctic Terns within a few feet, and many nests of Common Terns all around. Last year the number of unfertile eggs was remarkable, which is not the case this year, unless many of the eggs remaining in this new colony fail to hatch.

H. W. ROBINSON.

WHITE STARLING IN ESSEX.—Mr. R. E. J. Edwards reports that on August 10th, 1930, he saw a White Starling (*Sturnus v. vulgaris*) feeding and flying in company with a small flock of normally coloured birds on Mersea Island.

COMMON SCOTER INLAND IN LANCASHIRE.—Mr. Clifford Oakes writes that on August 31st, 1930, he watched an adult male *Oidemia nigra* on the Ribble between Eddisford Bridge and Mytton.

CENSUS OF HERONRIES.—*Correction*.—Mr. W. E. Glegg informs us that he has ascertained from Mr. C. H. Row that the nest at Bulmer, placed under Suffolk in Mr. Nicholson's "Supplementary Report" (*antea*, Vol. XXIII., p. 328), is actually in Essex.

OYSTERCATCHER NESTING IN KENT.—With reference to the note on this subject (*antea*, Vol. XXIII., p. 278) Mr. L. H. Dagley informs us that he again found a nest of the Oystercatcher (*Hæmatopus o. ostralegus*) in the same neighbourhood of Sandwich on June 9th, 1930.

BLACK TERNS IN SURREY AND WILTSHIRE.—Mr. E. L. King states that on April 30th, 1930, he saw a Black Tern (*Chlidonias n. niger*), in breeding-plumage, at the Barn Elms reservoirs, and that on August 2nd, at the same place, he watched for over an hour four immature birds of the same species, and on September 13th saw two adults there. The same observer saw an immature Black Tern flying over Wilton Water, near Savernake, on September 6th.

BLACK TERNS IN WORCESTERSHIRE.—Mr. E. St. George Betts reports that in the evening of August 2nd, 1930, two Black Terns (*Chlidonias n. niger*) were hawking over the Upper Bittell reservoir, near Barnt Green. Three Common, or Arctic, Terns, were present also. All five had gone the next morning.

LITTLE TERN NESTING IN KENT.—Mr. L. H. Dagley informs us that the Little Tern (*Sterna a. albifrons*) nested on the stretch of shore between Sandwich and Deal this season. In June he found five nests, and from the number of birds seen considered there were about six or seven breeding pairs.

REVIEWS.

British Birds. By F. B. Kirkman and F. C. R. Jourdain. 4to. T. C. and E. C. Jack, Ltd. 21s. net.

THIS book consists of 200 coloured plates, on the back of each being printed details concerning the bird or birds depicted in the plate facing it. There are 179 plates of birds, representing 227 species, and 21 plates of eggs. These plates are from the *British Bird Book*, published 1910–1913, and are for the most part excellent pictures of the adults of the species represented. The majority are by Mr. A. W. Seaby, and we wish that we might see more of his bird-drawings as they are not only good likenesses but also good pictures. Mr. Gronvold is responsible for the plates of eggs, which are quite good. The letterpress consists of a very brief description, a short general account of range and habitat, details of the nest and eggs and food, and a paragraph on "usual Notes." All this seems to be very carefully done, and the information given may certainly be relied upon. As not more than one page is allotted to each species the matter is necessarily brief, and when two or three species have to be described on the single page a smaller type has been used. Most of the rarer visitors are omitted and where there are two or more subspecies they are grouped together.

The book is thus rather an unusual combination, the plates being large, while the letterpress, very useful and reliable so far as it goes, is more adapted for a pocket book. This combination, however, should suit a good many.

The Rookeries of the Oxford District: A Preliminary Report. By E. M. and B. D. Nicholson—*Journal of Ecology*, Vol. XVIII., 1930, pp. 51–66.

THIS valuable paper on the ecology of the Rook (*Corvus f. frugilegus*), representing what it is not too much to describe as almost a pioneer effort in this country in the field with which it is concerned, deserves the careful attention of all ornithologists—happily now an increasing number—who realize or are beginning to realize the urgent need for intensive studies of this nature if any real insight is to be gained into the life of birds.

The investigation was carried out as part of the co-operative field-work of the Oxford Ornithological Society, but the credit for the organization and the admirable working up of the results and conclusions rests, as the reviewer is in a position to testify, entirely with the authors. The survey covered 224 square miles of the country round Oxford, including a fair variety of ground, "ranging geologically from lias to alluvium and agriculturally from the great unenclosed ploughlands about Chalgrove to the pasture and hay of the Thames Valley and the minor afforested areas of Tubney and Bagley Woods". All the rookeries in this area were located and mapped while the trees were bare, the country being worked systematically on the basis of the squares of the 1-inch Ordnance Survey, and from mid-March it was possible to concentrate on the actual counting of nests.

The number of nests at the height of the breeding-season is taken as representing the number of pairs in the rookery, no indications being found of the existence of any significant number of non-breeding birds, while the blowing out of nests during a rough winter like that of 1927-8, combined with the plundering of any unoccupied ones for building material, is considered to result in the numbers of nests extant during the breeding-season and of those actually occupied being for practical purposes substantially the same. Clearly some such assumption has to be made in a census of this sort, and in the present case it was based on sound observational grounds, but we should welcome further evidence as to how far it can be accepted as a safe basis for similar work in other circumstances and places.

Within the necessary limits of a review like the present, it is scarcely possible to do justice to the wealth of interesting data which the paper contains, and only some of the more salient points can be indicated. 6,733 nests were recorded, from 101 sites, the number at each ranging from 683 in one instance to a few cases of solitary nests. This gives an average of 66.66 nests per site. We doubt, however, whether the arithmetical average in a case like this means very much and may venture to suggest that the modal number, or in other words, the commonest size for a rookery, which is here something between ten and fifty nests, is more significant.

The authors emphasize that the conclusions which they draw from this single survey must necessarily be tentative and subject to confirmation or the reverse by future work, but nevertheless they are interesting and suggestive. The distribution of rookeries in the area proves to be far from uniform. "On the contrary they form groups or straggling lines, as if they had radiated from various centres of dispersal within the limits imposed by circumstances, advancing very slowly and leaving large areas uncolonized." Suitable breeding-sites abound, and evidently food supply is the main limiting factor in determining the local range. A marked preference is shown for river levels, the large majority of nesting-sites being on or close to one of the rivers or larger streams, but the preference does not extend to all river levels equally, and the geological formation, acting, no doubt, indirectly through the fauna and flora, would appear to be a further factor. The results of the survey suggest that the Oxford and to a less extent the Kimmeridge Clay, with the Portland Beds and Shotover Sands, are distinctly repugnant to Rooks for foraging purposes.

Reference is made to data obtained concerning the prevalence of gape-worms (*Syngamus*) in Rooks (*cf.* Elton and Buckland—*Parasitology*, Vol. XX., 1928, pp. 448-50), a fact evidently of some

importance, both on the biological side, since it may operate in some measure as a natural check on numbers, and on the economic, since Rooks may assist in spreading the parasite amongst poultry.

Some data are also recorded concerning several species of birds which may be regarded as directly or indirectly competing with the Rook in the Oxford area. Some evidence is found that abundance of Jackdaws is unfavourable to Rooks, and there is some indication of a certain degree of mutual exclusiveness between the Rook and the Lapwing owing to friction on the breeding-grounds of the latter. Some facts are also given concerning the local distribution of the Carrion-Crow, but this differs too much in its feeding-habits and is, in any case, too scarce to be a serious competitor.

In conclusion, the authors point out how much better the economic status of the Rook might be understood if an exhaustive and systematic investigation of the whole subject were undertaken in a single area like that of Oxford, so that a properly co-ordinated body of data could be obtained which could be used as a guide in similar work elsewhere, and they end with some suggestions and recommendations for further work.

While congratulating them on this excellent preliminary report, it is satisfactory to be able to add that, largely through the senior author's efforts, there now appears a good prospect of work in economic and ecological ornithology being placed on a permanent and properly financed basis at Oxford, so that further communications on the Rook investigations may be expected in due course.

B. W. TUCKER.

The Heron (Ardea cinerea) in Somerset. By B. W. Tucker, M.A., M.B.O.U.
Proc. Somerset Arch. & Nat. Hist. Soc., LXXV. (1929), pp. 61-90.

It was in Somerset in 1918 that the late Dr. Wiglesworth undertook the first local survey of heronries to reach a high standard of accuracy and completeness. The fact that Mr. Tucker is able to include two colonies of long standing which his predecessor had missed, beside others lately founded, is a fair indication of the further advance which has since been made. This new survey, based largely on the mass of data gathered by its writer as county organizer of the *British Birds* Census of Heronries in 1928, with many subsequent additions, is able not only to list and describe the occupied and vacant or extinct sites, with some details regarding their history and references to literature, but also to give a commentary based on first-hand knowledge which must prove of the utmost importance to future students. In Part II., to be published next year, treatment of the ecological aspect and general conclusions will complete a contribution which promises to become a model for investigators in this field.

Owing to the generosity with which Mr. Tucker has put his material at the disposal of the *British Birds* Census, his paper holds no surprises in the matter of unrecorded sites, but observers in all parts will find much interesting information which only a county survey based on intimate knowledge scientifically handled can supply. It may be recalled that Norfolk, Sussex and Somerset were the counties singled out in the *British Birds* Report (*antea*, Vol. XXII., p. 367) as particularly profitable for more detailed work; this admirable study is the more welcome because it fills an obvious need.

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REV. F. C. R. JOURDAIN, M.A., M.B.O.U., H.F.A.O.U., F.Z.S., AND

NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U.

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OUR PRESENT KNOWLEDGE OF THE BREEDING BIOLOGY OF BIRDS.

BY

THE REV. F. C. R. JOURDAIN, M.A., M.B.O.U.

Hon. Memb. of American, French, German and Dutch Orn. Societies.

SOME forty years have elapsed since I began to observe and collate data with regard to the incubation- and fledging-periods of our British birds, as well as the shares of the sexes in nest-building, incubation and care of the young. At that time the sum total of our knowledge on these subjects consisted of a few scattered notes in various ornithological books and periodicals, many of them based on the observations of Naumann and Tiedemann copied and recopied from one author to another without verification. It is only necessary to refer to the standard English works on ornithology, published between 1870 and 1890, such as the fourth (Newton-Saunders) edition of "Yarrell", Seebohm's *British Birds* and the first edition of Saunders's *Manual*, to realize that this was then largely an unworked field.

In 1891 the late William Evans published a valuable paper in the *Ibis* (pp. 52-93) on the Incubation Periods of Birds, in which he not only gave references to previous observations, but contributed the results of a series of experimental hatchings in incubators, supplemented by a certain amount of field observation by the writer and Mr. Bruce Campbell. Some supplementary results were also published in the *Ibis* for 1892, pp. 55-58. Important though these papers were, for they provided a basis of facts for future work, their scope was confined to one period in the breeding biology of the bird, and left the other points untouched. Good service was, however, done by the discrediting of various statements which had been frequently republished, although undoubtedly erroneous. From this time onward there was a lengthy period when progress was exceedingly slow, until the publication of the *British Bird Book* (1910-13), in which a new emphasis was laid on the life-story of each bird, while in 1919-24 the *Practical Handbook* appeared. In both works severely condensed accounts of the "breeding-habits" of each species (for which I was responsible) briefly summarized what was known not only with regard to the nest and eggs, but also the incubation-period and in some cases the share of the sexes and number of broods. Needless to say, the gaps in our knowledge were innumerable, but the publication of the

results stimulated observation, and this magazine provided a convenient vehicle for the *addenda et corrigenda*, which at once began to accumulate. Another unforeseen result of the wide circulation of the *Practical Handbook* among continental ornithologists was the stimulus given to field-observation on points still obscure. Not only at home in the pages of *British Birds*, but also abroad, and perhaps especially in Germany, this branch of ornithological study was taken up with enthusiasm and many valuable and exhaustive papers and notes appeared in foreign literature. Sidelight from another quarter has also been provided by the wonderful work of the Heinroths in Germany in rearing the young of innumerable species in captivity from the egg and recording photographically their changes in development, thus furnishing opportunities for checking results already obtained and incidentally throwing light on many obscure points. In 1922 Heinroth made a rather ambitious attempt to show graphically the relation between incubation-period and egg weight in the different families of birds, as also between the weight of the bird and its egg or clutch of eggs. In the present imperfect state of our knowledge all such summaries must be provisional and subject to later revision, but it is becoming increasingly evident that the time has come for us to take stock of our results in order to ascertain where observation is most likely to be useful in future, and what modifications are necessary or desirable in our methods.

First of all, let me emphasize the point that *every* detail in the life of the bird is of importance. For example, most valuable and interesting light is thrown on the relationship of the small passerine birds by noting the different shares of the sexes in the choice of the nesting-site and actual building and lining of the nest. We need careful observations on these points in most cases.

Let us take, for example, the Finches and Buntings. There are still a good many species concerning which we have no reliable information, but whenever one of these birds has been closely watched, it has been noticed that all the actual work of building was done by the hen, the cock accompanying her all the time. There is, however, one group which is an exception to this rule. Most people have seen male Sparrows struggling with unmanageable nesting material. Is it not somewhat significant that Sushkin has now shown that the affinities of the Sparrows lie with the Weaver Birds, rather than the typical Finches?

With regard to the incubation-period, some rather surprising discrepancies began to be evident in certain cases, as records accumulated. Probably in most cases these are due to the fact that the period has not always been calculated from the time when incubation actually began. Moreover, this may vary in individual birds. Most of the early observations on this point were calculated from the day on which the last egg was laid, but Dunlop called attention to the fact that many species begin to incubate with the first egg laid, or at any rate prior to the completion of the clutch. This points to a considerable margin of possible error, especially in the case of those families where the intervals between the laying of the eggs are prolonged to two and even three or more days. Of course, observations on these lines are by no means easy and necessitate very careful watching. The behaviour of one female is not necessarily typical of the whole species. An extreme instance is the case of the Barn-Owl (*Tyto alba*), in which some hens lay their clutches in pairs, with an interval of a week or more between each pair of eggs and a forty-eight hour interval between the eggs of each pair. There are, however, cases in which all the eggs of the clutch are laid at almost equal intervals, probably about forty-eight hours in each case.

Where nothing is known as to the length of the incubation-period, results calculated from the laying of the last egg are still useful, but this should be definitely stated, and the time taken in hatching from the first to the last egg should be noticed, as this gives some indication as to whether incubation began before or after the completion of the clutch. It is important also to record whether any of the eggs do not hatch, as, unless marked as laid, this provides a potential source of error, for the infertile egg may possibly be the last laid.

With regard to the Scotch and Irish races of passerine birds, it might at first sight seem superfluous to accumulate data on the incubation- and fledging-periods of three races of Wren in addition to the ordinary form. In nature it is always rash to take for granted that there will be no appreciable difference in such instances. As palpable differences are already known to exist in some cases in the eggs of sub-specific forms, it is quite possible that similar differences may also exist in these periods. At any rate, the question should be settled by observation, and at present we have practically nothing on record as to either incubation- or fledging-period of any of our local races, so that the fortunate

field-worker who has opportunities for noting these particulars in the case of the

Irish Jay	Hebridean Thrush	Hebridean Wren
Scotch Crossbill	St. Kilda Wren	Irish Dipper
Irish Coal-Tit	Shetland Wren	

will have the satisfaction of knowing that all such notes are really useful as filling up gaps.

Among the passerres it should be noted that at present we are still without recent information as to the incubation-period of the

Jay	Rock-Pipit	Willow-Tit
Hawfinch	Coal-Tit	Chiffchaff
Tree-Sparrow	Crested Tit	Wheatear
Corn-Bunting	Marsh-Tit	Sand-Martin

As may readily be seen quite a large proportion of these birds nest in covered sites, thus rendering observation difficult.

It is true that in some cases there are statements in Naumann and other old authors, but these need verification. Supplementary observations on the incubation-period are also desirable in the case of the

Raven	Tree-Pipit	Marsh-Warbler
Hooded Crow	Meadow-Pipit	Garden-Warbler
Jackdaw	Yellow Wagtail	Lesser Whitethroat
Chough	Grey Wagtail	Dartford Warbler
Siskin	Tree-Creeper	Ring-Ouzel
Twite	Nuthatch	Whinchat
Crossbill	Bearded Tit	Stonechat
House-Sparrow	Wood-Warbler	Redstart
Cirl-Bunting	Grasshopper-Warbler	Nightingale
Wood-Lark	Reed-Warbler	House-Martin
Sky-Lark		

With regard to the fledging-period, we are still without any definite information in the case of the

Hooded Crow	Coal-Tit	Chiffchaff
Twite	Crested Tit	Wood-Warbler
Crossbill	Marsh-Tit	Lesser Whitethroat
Corn-Bunting	Willow-Tit	Wheatear
Sky-Lark	Bearded Tit	Sand-Martin

While supplementary observations are desirable in the cases of the

Raven	Reed-Bunting	Reed-Warbler
Rook	Wood-Lark	Marsh-Warbler
Jackdaw	Tree-Pipit	Garden-Warbler
Jay	Meadow-Pipit	Dartford Warbler
Chough	Rock-Pipit	Ring-Ouzel
Hawfinch	Yellow Wagtail	Whinchat
Siskin	Grey Wagtail	Redstart
House-Sparrow(!)	Nuthatch	Nightingale
Tree-Sparrow	Red-backed Shrike	Dipper
Corn-Bunting	Pied Flycatcher	House-Martin
Cirl-Bunting	Grasshopper-Warbler	

Coming to the non-passerine species, we have no British records of the incubation-period in the following species:—

Kingfisher	Shag	Whimbrel
Green Woodpecker	Fork-tailed Petrel	Roseate Tern
Lesser Spotted	Slavonian Grebe	Common Gull
Woodpecker	Black-necked Grebe	Great Black-backed
Barn-Owl	Black-throated Diver	Gull
Hen-Harrier	Red-throated Diver	Great Skua
Red Kite	Dotterel	Black Guillemot
Garganey	Kentish Plover	Spotted Crake
Goosander	Greenshank	Water-Rail
Merganser	Red-necked Phalarope	

There are also many species of which we have only scanty data, among which the following may be mentioned:—

Great Spotted	Storm-Petrel	Woodcock
Woodpecker	Shearwater	Arctic Tern
Short-eared Owl	Fulmar	Herring-Gull
Hobby	Great Crested Grebe	Lesser Black-backed
Golden Eagle	Little Grebe	Gull
Marsh-Harrier	Wood-Pigeon	Kittiwake
Heron	Stock-Dove	Arctic Skua
Whooper	Rock-Dove	Razorbill
Gadwall	Turtle-Dove	Guillemot
Wigeon	Oyster-Catcher	Puffin
Pintail	Golden Plover	Corncrake
Pochard	Dunlin	Ptarmigan
Scoter	Redshank	Quail
Cormorant		

In some of the above-mentioned species we have information available from continental sources. Thus the Black-throated Diver's incubation-period has been observed in Sweden, but no notes have been taken in the British Isles.

When we come to the consideration of the fledging-period of non-passerine birds we are faced with special difficulties in the orders Anseres and Pygopodes, which leave the nest at a very early stage and take to the water. Similar difficulties attend the definition of the fledging-period of the Limicolæ, Rallidæ and Galli, which leave the nest as soon as their down is dry, and to some extent also with the Lari, though the movements of the young are more restricted in this family, and in some cases where the breeding-ground is not extensive the difficulties might be overcome by systematic ringing and daily observation.

In the other orders it should be noted that we have no data from British sources on the fledging-period of the following species:—

Green Woodpecker	Red Kite	Fulmar
Lesser Spotted	Heron	Turtle-Dove
Woodpecker	Shag	Guillemot
Hen-Harrier	Fork-tailed Petrel	

In the orders previously mentioned we have only a few approximate estimates, and only in the case of some of the Striges and Accipitres and a few isolated species of other orders such as the Swift, Nightjar, Kingfisher(1), Shearwater, Moorhen and Coot, have we a few more or less definite estimates. It is evident that here avicultural observations would form useful checks and at any rate provide us with an approach to the facts under natural conditions.

One point which has not yet been mentioned is the share of the sexes in incubation. Here we can only hope to reach finality by slow degrees. If, for example, the male only relieves the female for short intervals during the day, it is quite possible to visit a nest several times daily during the incubation-period and yet to overlook the share of the male altogether. It has been stated that in some genera (e.g., *Picus*) the male incubates at night and the female by day. As nearly all our observations are made during the day, here is another possible chance of error in observation. In many species the sexual distinctions are so slight that it is practically impossible to distinguish them in the field, while in others (and especially among the Limicolæ) the female has frequently been mistaken for the male.

I would appeal to all readers who send notes on incubation-periods in future to state definitely from what point the period is calculated, and also whether the young were all hatched on the same day or not.

Where the sexes are distinguishable it is always advisable to note at the time the sex of the incubating bird, and the "change over" is evidence that both sexes are taking part even when the sexes cannot be distinguished by the observer. Such notes may not be of sufficient importance to warrant publication and yet may serve a very useful purpose when taken in conjunction with large numbers of reports from other sources.

Finally, there are two points on which I should like to focus observation. G. Stein, from observations in Germany, is of opinion that in the case of the Common Sandpiper (*Tringa hypoleucos*) incubation is carried on, chiefly at any rate, and probably entirely, by the male bird. This is based mainly on the notes of the bird flushed from the eggs. Apparently the male also takes charge of the young. Schenk has furnished confirmation of this by recording males fairly frequently obtained from the eggs. Residents in northern

England should have many opportunities of testing this statement.

As far back as 1924 M. Portal (*Brit. Birds*, Vol. XVII., p. 315) furnished evidence that the hen Red-legged Partridge (*Alectoris r. rufa*) lays two clutches of eggs, one of which is incubated and reared by the cock, while the hen takes charge of the other. The article should be carefully read, and notes on the number of eggs in the clutch, whether both parents are ever to be met with accompanying the young birds, or whether each tends a separate brood, would be of considerable interest. The only published comment (excepting a note or two in the pages of the *Field*) which I have seen on the statement is a decidedly sceptical article by Otmar Reiser, yet in a few cases where I have met with newly hatched young, I could not see any sign of more than one parent. Surely among the readers of *British Birds* there must be many who could throw light on the question!

THE SPRING MIGRATION, 1930, AT THE CAMBRIDGE SEWAGE FARM.

BY

DAVID L. LACK.

THERE are many accounts of autumn movements of waders at inland sewage farms and reservoirs, but I can find no record of a big spring movement inland. This spring there was an extremely large passage movement at the Cambridge Sewage Farm and twenty-one species of waders were seen. Last autumn twenty-two were seen, the only other occasion of which I know when over twenty species have occurred at an inland locality during one migration. Some of the commoner species appeared in exceptionally large numbers, and the amount of visible migration which occurred during the day also seems to have been unusually large. The observations were not confined to waders but, save for the Terns, accounts of other groups are mainly of local interest and will be published in the Cambridge Ornithological Report for 1930. I include here only a few records of the less usual species.

The Sewage Farm was visited on most days between March 1st and March 22nd. In the Vacation, March 22nd to April 20th, it was visited intermittently, but during this period little movement seems to have occurred. From April 20th to June 14th an average of three visits were paid each day: normally, one in the morning, one in the afternoon and one in the evening. Such regular visits were essential, though not always possible, as many birds stopped for a very short time. It was impossible for a single observer to do this work and I am greatly indebted to several members of the Cambridge Ornithological Club, in particular to Messrs. C. W. Benson, A. B. Duncan, H. B. Garland and J. H. White, for their consistent help.

The following is a summary of the main movements of the waders and Terns. From March 5th to March 17th Redshank and Golden Plover passed through in large numbers. From March 22nd to April 20th there seems to have been very little passage of waders. From April 22nd to May 4th occurred a small movement of Dunlin, and on April 24th there was a passage of Terns. On the morning of May 6th there was a large movement involving Dunlin, Common Sandpiper, Ringed Plover and Terns. From May 7th to May 17th it was mainly quiet, Common Sandpiper

passing in the earlier part. From May 18th to May 26th occurred the largest movement of the spring. Ringed Plover, Dunlin, Sanderling and Terns were the chief participants, but Turnstone, Curlew-Sandpiper, Little and Temminck's Stint, Greenshank, Wood- and Green Sandpiper, also occurred. There was a thunderstorm at 8.30 p.m. on May 26th, and when it commenced all the waders then present left the Sewage Farm. Subsequently, only Ringed Plover continued to pass. The numbers reached a climax on June 1st but decreased rapidly after this. From June 1st to June 8th there was an arrival of birds which had not attained their full summer plumage: several Ringed Plover, five Dunlin, three Little Stint, a Sanderling, a Turnstone and a Wood-Sandpiper. Probably these birds were not going to breed, otherwise they would presumably have attained full plumage before so late a date. After June 8th Ringed Plover were the only waders passing through. There were six on June 14th, but none were left on June 20th.

This summary shows that the most favourable time at the Sewage Farm for both waders and Terns was the fourth week in May. This does not necessarily mean that the spring migration was then at its height. The variation in the numbers of birds there probably does not depend only on the suitability of the conditions for migration. Perhaps more take an inland route at certain periods than at others. Also the number of birds at the Sewage Farm may not necessarily be proportional to the number of birds migrating over Cambridge. Under some conditions passing birds may not alight.

Waders arrived and departed in small parties which sometimes consisted of more than one species. On first arriving they were usually wild, called repeatedly and, if flushed, were apt to fly on at once. They later grew tamer, but, just prior to their departure, were again in an excited state, calling and stretching their wings. Sometimes they were observed to leave of their own accord after such a display. Normally the observer had not sufficient time to wait for this, and then the act of flushing the birds often provided them with the final stimulus to resume migration. On one occasion the flushing of three Wood-Sandpipers on the next tank seemed to act in this way on a party of Ringed Plover and Dunlin, probably because the former called loudly when put up. Not necessarily did all the members of a party leave together. On one occasion I watched

fourteen Ringed Plover from which, after much calling, ten got up and flew off northwards. Of these three turned aside after going a short way and returned to their feeding companions and only seven migrated out of sight.

Both Common and Wood-Sandpipers performed their courtship flight and trill when passing through on migration. Certain Passerines and a few other birds sing on migration, but I was not aware before that waders did so. It is also interesting that, just prior to their resuming migration, Black Terns, Turnstone and perhaps Little Stints should utter the alarm-note of the breeding-ground. In the case of the waders the birds were not in full summer plumage and were presumably immature.

Waders arrived and departed at all times of day, but none came in or left during the night, for there were always the same number present in the late evening as there were early the following morning. There was nearly always one arrival each day, but more than two were rarely noted until May 18th. From then until May 26th there were often at least three or four during the day. Even at this period the arrivals were not continuous, and intervals of an hour or more would elapse between each one. This was in contrast to the Terns, which came in on very few days during the spring, but when they did come usually arrived in a rapid succession of small parties.

On May 6th there was an exceptional movement of waders; Terns and Hirundines also passed. There was continuous rain most of the morning and a mild north wind. At 9.30 a.m. a number of Hirundines were already present and many others came in during the morning, a few Swifts (*Apus a. apus*) being with them. By 10.30 a.m. I had been round the Sewage Farm and one Common Sandpiper was the only wader seen. At 10.35 a Whimbrel flew over N.N.E. At 10.50 there was a Black Tern over one of the tanks, and shortly after two Ringed Plover and then a Dunlin flew in from the S.W. At 11.5 six Dunlin flew straight over, going N.E. At 11.8 I saw an Arctic Tern descend from a height from the S.W. It joined the Black Tern and hawked for insects over the water amid a crowd of Hirundines. At 11.22 three more Dunlin arrived and a minute later I saw a Little Tern beating steadily in from the S.W. It joined the Hirundines over the water but passed on after five minutes. The weather now temporarily cleared and no further movement took place until 12.20. Then thirteen Dunlin flew in

and five minutes later six Common Sandpiper and about twenty Ringed Plover. The last passed on almost at once, but the Dunlin and Common Sandpiper stayed for an hour. During the afternoon the north wind became almost a gale and no further arrivals were noted. At 8.0 p.m. no Terns and only one Dunlin and four Common Sandpiper remained. A passage on the scale of the above was observed on no other occasion during the spring.

Most of the Terns flew straight over the Sewage Farm without halting; others spent a longer or shorter interval hawking for insects over the tanks before passing on. Rarely one alighted to rest and once one stayed the night, this bird, a Black Tern, appearing to be exhausted. The stay of many of the waders was almost as brief. Parties not infrequently flew straight over without alighting. These had descended; for once away from the Sewage Farm they rose considerably higher. Most waders stopped only a few hours, but if they came in late in the evening they often stayed the night. Only rarely did birds stop more than two nights. This short stay was a contrast to the autumn migration, when birds often stayed a week or more, recuperating before their next flight.

When possible the direction taken by arriving and departing migrants was noted. The direction of arrival could not be precisely obtained as birds were rarely seen until nearly over the Sewage Farm. It varied round about south and west, but little more can be said. The direction of departure was easier to ascertain as birds could be watched until out of sight. A Lesser Black-backed Gull went over north on April 27th and two north-east on April 30th. Of Terns, on April 24th a party of six left somewhat north of east; two passing separately went somewhat south of east. On May 6th two left somewhat north of east. During the passage of May 23rd to May 26th two birds went slightly north of east; three, all separate, north-east, and seven parties, twenty birds in all, north. Of waders, on May 6th a Whimbrel passed somewhat north of east and a party of Dunlin about north-east. Between May 18th and June 6th the direction taken by eleven parties, involving nine species of waders, was noted. In nine cases they went off about north-east and twice north. Assuming that the north-easterly direction was maintained by the waders after they were out of sight, it means that they would arrive on the north Norfolk coast, about forty miles from Cambridge. If

they had been travelling north-east before reaching Cambridge, the Hampshire coast was perhaps their point of origin. It is perhaps worth noting that two other inland localities where waders are abundant, Tring Reservoirs and the Reading Sewage Farm, lie near this line.

Six species of waders seen at Cambridge this spring, Curlew-Sandpiper, Little and Temminck's Stints, Wood-Sandpiper, Bar-tailed Godwit and Grey Plover, are considered rare inland in England at this season, and perhaps Oyster-Catcher, Turnstone, Sanderling and Greenshank might be added to these. All these, save the Temminck's and perhaps the Little Stint, are regular in spring on the Hampshire and north Norfolk coasts, probably the localities between which they were travelling. As at least twenty-six Sanderlings passed through and several of the other birds occurred on more than one occasion, there was plainly a steady inland passage of the waders which have hitherto mainly been noted as travelling northwards by a coastal route. From the consistency with which the typically coastal waders occur in autumn, it is apparent there is a regular passage inland at that season. Evidence of a corresponding spring movement is at present scarce, but the inland localities suited to waders are fewer in spring than in autumn and those which exist seem rarely to have been adequately watched. Mr. H. G. Alexander (*antea*, Vol. XXIII., p. 238) records at the north Worcestershire Reservoirs in the spring of 1929 a passage of Dunlins and Ringed Plover until well into June, and the occurrence of Turnstones and a Sanderling in May. There are also many isolated spring records of the rarer waders inland which suggest that with more consistent watching a spring passage corresponding to that of the autumn might be shown to occur. In considering the seeming abnormality of the present records the extreme suitability of the area must be taken into account. Cambridge has long been noted for the waders which pass over it at night, and the observations made at the Sewage Farm in the past few autumns suggest that more waders occur there than at any other inland locality in England. So far the area has been regularly visited during only one previous spring, that of 1928, when no movement occurred on the present scale. Only future observations can determine how often a movement occurs on the scale of this year. I think that these will show that the typical coastal waders now recorded inland nearly every autumn, although perhaps not

annual in spring, occur much more often than past records would suggest.

The following is a list of the more interesting species observed. With the more unusual species I have added the initials of the observer who identified it. Thirteen of the following species have been recorded for Cambridgeshire under five times, but the number of previous records, owing to the paucity of local observations, have little scientific value and are no guide to the true status of the bird. Hence I omit them. References to them and the field-notes supporting identification will be found in the Cambridge Ornithological Club Report for 1930.

GREENLAND WHEATEAR (*Enanthe æ. leucorrhoa*).—A male was seen from May 1st to May 4th (H. R. Kirkwood, H.B.G.) and another male on May 18th and May 19th (D.L.L.).

SAND-MARTIN (*Riparia r. riparia*).—The three species of Hirundines were common during migration. As late as June 1st about forty Sand-Martins arrived and on June 7th and 10th there were fresh arrivals of about fifteen birds.

SWALLOWS (*Hirundo r. rustica*) and MARTINS (*Delichon u. urbica*) arrived with them in similar numbers. For the latter such a late passage is normal, but it appears to be very abnormal for the Sand-Martin.

SHELDUCK (*Tadorna tadorna*).—Two ducks appeared on May 9th, one staying until the 16th. They were presumably on migration; it is unusual to see this species so far inland at this season.

OYSTER-CATCHER (*Hæmatopus ostralegus*).—Two arrived at about 4.0 p.m. on March 10th and probably left the same evening. They alighted on a path and did not attempt to feed.

RINGED PLOVER (*Charadrius hiaticula*).—One came in at about 4.30 p.m. on March 12th and probably left the same evening. On April 26th two appeared, there were three the next day, two until April 30th and one until May 5th. On May 6th twenty-two arrived but stopped only a few minutes. No more were seen until May 18th when twelve appeared. Their numbers fluctuated between three and seventeen until May 30th, a change taking place often three times a day. On one occasion nine flew over without alighting and this perhaps occurred frequently, as it is likely to be overlooked. On June 1st the number rose as high as thirty-three, after which it fell off rapidly to two on June 9th. Even after this a few were seen every day until June 14th, our last visit. In

early June several appeared with the head markings, which are normally black, represented by brown, and at least one had an incomplete breast band. These could hardly have been birds of the year on their return passage, and were probably birds in their first summer which had not attained maturity. This spring a minimum of one hundred and thirty individuals passed through, a larger number than was observed of any other wader. The late date up to which they passed is interesting, but Mr. H. G. Alexander (*loc. cit.*) records a similar June movement inland in Worcestershire in 1929, so perhaps such a late passage is not unusual. In the *Practical Handbook* the spring migration is said to last only until mid-May.

GOLDEN PLOVER (*Ch. apricarius*).—Large numbers were heard passing over Cambridge at 3.30 a.m. on March 7th, probably travelling east. For the next four days small flocks were seen around the Sewage Farm.

GREY PLOVER (*Squatarola squatarola*).—One in full summer plumage arrived in the afternoon of May 31st and departed north-east when put up (C.W.B., A.B.D.).

TURNSTONE (*Arenaria interpres*).—At 1.8 p.m. on May 20th two flew in with two Ringed Plover and alighted amid a feeding flock of Ringed Plover and Dunlins. After two minutes they departed in a northerly direction. On May 25th another arrived and departed north-east the next day at 8.30 p.m., at the commencement of a thunderstorm. On June 5th one arrived which differed from the others by not being in full summer plumage. The next day it appeared very wild and called repeatedly, both on the ground and in flight. This call was quite new to me, being a loud, sustained, rather harsh whistle, sometimes repeated rapidly to produce a rattling note not unlike the typical call, but louder and richer in quality. Descriptions of the alarm note at the breeding grounds (*antea*, Vol. XV., p. 177, and Vol. XIX., p. 6) correspond closely with the note I heard and I have no doubt it was the same. After calling repeatedly the bird departed north.

RUFF (*Philomachus pugnax*).—A Reeve came in on March 12th at 4.15 p.m. and stayed until March 15th (H.B.G., D.L.L.). This is an extremely early but not unprecedented date (see *antea*, Vol. XXII., p. 192, a record of three at Oxford, March 8th to March 14th, 1928). The only other seen was a Ruff on June 8th (D.L.L.).

SANDERLING (*Crocethia alba*).—One was seen on May 10th. On May 18th seven appeared and, like the Dunlins and Ringed Plover with which they came, their numbers fluctuated rapidly, between two and nine, until May 21st. The next seen were four on May 25th, one more the next day and a last bird on June 1st. At least twenty-six birds passed through, of which two were in full summer plumage. Yet the bird is said to be unusual inland in England in spring.

DUNLIN (*Calidris alpina*).—First seen on April 22nd, but how many occurred during the Vacation is uncertain. The number rose steadily to sixteen on April 27th and then decreased to one on May 2nd. On May 3rd eight appeared and on May 4th five flew straight over without alighting. On May 6th twenty-three were seen, which all left the same day. A few birds were seen from May 7th to 11th and two on the 16th. On the 18th eight appeared. Until the 27th they, like the Ringed Plover and Sanderling, changed in numbers several times each day, varying between one and ten. After the 27th only one was present until June 2nd, when another arrived, in almost complete winter plumage. The number present rose to five on June 4th, one being left on the 6th, the last seen. None of these last birds had attained full summer plumage. They were the only Dunlin seen in incomplete moult since April. The number of birds which passed during the spring was at least one hundred and seven.

CURLEW-SANDPIPER (*C. testacea*).—One in almost complete winter plumage was seen on May 22nd and 23rd (A.B.D., J.H.W., D.L.L.).

LITTLE STINT (*C. minuta*).—One in summer plumage was seen in the early morning of May 25th. At 8 a.m. it flew off N.E. with its companions, Ringed Plover and Dunlins (D.L.L.). On June 6th three appeared which, when flushed, left N.E. at 9.20 p.m. These were not in full summer plumage, for two had pure white chests, the other only faintly brown striations (J.H.W., D.L.L.). As they rose to leave they uttered several thin, clear, whistling notes, somewhat reminiscent of the call of the Common Sandpiper. This note was quite distinct from the bird's typical triple call, which I know well, being more prolonged and less sharp and harsh. It was possibly a note of the breeding-ground, as in the case of the Turnstone, but descriptions of the breeding-ground call-notes do not quite agree with my impression of the note.

TEMMINCK'S STINT (*C. temminckii*).—At 6.30 p.m. on May 23rd I saw a tiny wader fly in from the south-west. Its flight was very similar to a Sand-Martin's, and it repeatedly uttered a thin, vibratory note which might be written "ptirrrt." It settled within thirty yards and proved to be a Temminck's Stint. The wings and chest were far greyer than those of *C. minuta*, and the pale, not black, legs were conspicuous. On repeatedly flushing it I had several clear views of the white outer tail-feathers, while its repeatedly uttered call-note, absolutely distinct from that of the commoner bird, was further corroboration of its identity. That evening I showed it to A.B.D. and J.H.W. and the next morning to Mrs. M. D. Brindley, who was able to confirm the identification from her experience of the bird in its Siberian breeding-grounds. The best views I obtained of the bird were in the late evening, when it allowed close approaches, the nearest being within about seven yards. It generally kept by itself, but at times associated with a party of Dunlin and Ringed Plover.

COMMON SANDPIPER (*Tringa hypoleucos*).—Birds were seen singly and in twos and threes from April 20th to June 2nd. On May 6th six arrived and by May 9th there were nine, but they soon departed. This was the only period during which more than four birds were seen together. On May 9th one repeatedly performed its nuptial flight and trill.

WOOD-SANDPIPER (*T. glareola*).—Two came in on the morning of May 24th. There were three the next day and they left on the 26th at 8.30 p.m., when a thunderstorm commenced. On the 25th one performed its nuptial flight when flushed. This struck me as being very similar in character to that of a Common Sandpiper, but the trilling note differed in quality. On June 8th and 9th another bird was present. It was in poor plumage compared with the earlier ones, the white spots on the wings being indistinct and the whole plumage much duller; it was probably moulting. This was a late bird; in the *Practical Handbook* the migration is said to last only during April and May.

GREEN SANDPIPER (*T. ochropus*).—The scarcity of this species was remarkable in a spring when nearly all waders were so abundant. One appeared on May 25th and another next day, when they both left.

REDSHANK (*T. totanus*).—Five wintered. On March 5th there were nine and they increased steadily to forty-two on March 12th. After this they slowly decreased, a few remaining to breed.

GREENSHANK (*T. nebularia*).—Three were seen on the morning of May 21st. They stayed only a short time (Mrs. M. D. Brindley).

BAR-TAILED GODWIT (*Limosa lapponica*).—One in full summer plumage was seen in a damp meadow adjoining the Sewage Farm on May 11th. It was extremely tame and allowed its magnificent plumage to be viewed at thirty yards. It stayed the whole day, keeping in the same field, although repeatedly flushed (H.B.G., D.L.L.).

CURLEW (*Numenius arquata*).—One flew over, calling, on April 22nd (J.H.W.).

WHIMBREL (*N. phæopus*).—One flew over, calling, on May 6th (D.L.L.).

BLACK TERN (*Chlidonias niger*).—These passed through on seven days, nineteen birds being seen in all, including seven on April 24th and five on May 26th. The last to be seen were two on June 4th. One which arrived on May 26th did not leave until May 28th; it appeared to be exhausted. On May 6th A.B.D. heard one utter a loud, harsh, disyllabic call reminiscent of the note of the Arctic Tern and quite distinct from the thin call-note normally heard on migration. On May 26th I heard three passing birds utter the same note. This call seems to be the alarm-note normally uttered at the breeding-grounds.

COMMON TERN (*Sterna hirundo*).—These occurred on April 24th and from May 24th to May 26th. Twenty-seven were seen, but not all were certainly distinguished from the next species.

ARCTIC TERN (*S. macrura*).—One was seen on May 6th and another on May 26th (D.L.L.). Others probably occurred, but it was impossible to identify many of the Terns as they flew over without halting.

LITTLE TERN (*S. albifrons*).—One was seen on May 6th.

LESSER BLACK-BACKED GULL (*Larus fuscus*).—One flew over north on April 27th and two north-east on April 30th; all these were adults. On June 10th three, all probably immature, flew over west. I presume these were not migrants but vagrant non-breeding birds.

NOTES

IMMIGRATION OF CROSSBILLS IN 1930.

THE immigration of Crossbills (*Loxia c. curvirostra*) from July onward in 1930 was evidently on a much smaller scale than in 1929. In England it has been difficult and often impossible to trace whether the appearance of Crossbills was due to fresh arrivals from the Continent or to more local movements of birds which had stayed over from the 1929 irruption. Reports from a good many districts state that a certain number of Crossbills were present throughout the spring and summer, and in some cases pairs were seen and thought to be breeding, though definite proof was lacking. From the middle of July onwards more birds were seen, but they were undoubtedly in much smaller numbers than in 1929. In the northern islands an immigration was clearly defined, but so far as information goes on a comparatively small scale.

It seems sufficient to give a *resumé* of the observations.

SHETLANDS AND ORKNEYS.—Passing parties in July at Fair Isle, but “not so many as last year,” and one seen in Shetland on July 14th (*Scot. Nat.*). About 24 miles due east of Wick on July 18th (N.E. wind) about thirty came on board and most remained until Kirkwall was reached and some until a few miles of Lerwick (H. A. Wallace *in litt.* to C. Oldham). In Orkney an exhausted pair on July 18th and subsequently a number of small parties (four to seven) (*Scot. Nat.*) One at Hoy on July 31st (W. Serle).

OUTER HEBRIDES.—One St. Kilda, July 22nd; one Barra, September 14th (A. MacRae).

SCOTLAND, MAINLAND.—Five at Deerness, Sutherland, August 28th (R. J. Buxton); many in Aberdeen and Forfar in August (W. S. Medlicott); single records in Fife and E. Lothian (*Scot. Nat.*); Peebleshire, party arrived July 10th (T. G. Laidlaw); at sea ten miles east of the Isle of May on July 19th a “large flight” was reported as passing a trawler, three birds alighting (*Scot. Nat.*).

ENGLAND.—Apparently new arrivals were reported, mostly in small numbers and sometimes single birds, from: Northumberland, July 18th (J. M. Craster), and a number on Holy Island on September 8th and apparently some weeks before (T. G. Laidlaw); Yorkshire (N.E.), some end July and numerous August (W. S. Medlicott); Lincolnshire, August (J. S. Reeve); Norfolk (north coast), September 18th (C. Oldham); Cheshire, July 25th (T. Perrin); Montgomeryshire, September 17th (J. Wood, F. R. Barlow); Shropshire, since July 15th a definite increase (H. E. Forrest); Herefordshire, new birds came in July (H. A. Gilbert); Worcestershire, July 15th, 31st, August 8th (J. D. Wood, F. R. Barlow, J. S. Elliott, E. St. G. Betts); Warwickshire, August 17th (H. A. Gilbert); Hertfordshire, August 20th (C. Oldham); Surrey, August 10th, 12th (H. Bentham); Sussex, August 10th

(E. Dann); Hampshire August 12th and 17th and September 10th (J. R. Wood, F. R. Barlow, M. C. W. Dilke, F. C. R. Jourdain); Dorset, August 12th–27th (J. D. Wood, F. R. Barlow, Lord Cross); Pembroke-shire (S.W.), August 25th (R. M. Lockley); Scilly Isles, September 9th, large flock and previously a few (A. W. Boyd).

FOOD.—Mr. H. E. Forrest writes that Crossbills were seen eating garden peas at Boreatton Park, Shropshire. In the same county, at Munslow, the Rev. E. Powell, on September 22nd, finding that every apple on two trees, though still *in situ*, had been sliced open and the pips removed, set a watch, and seeing some birds at the apples shot one, which proved to be an adult male Crossbill (*cf. antea*, pp. 125–6).

H.F.W.

CROSSBILLS BREEDING IN SURREY.

EARLY in 1930, Crossbills (*Loxia c. curvirostra*) were present in considerable numbers throughout north-west Surrey, and were observed by us in five separate localities:—

- (1) April 6th.—A flock of twenty-five to thirty; and at the same place on April 18th a female feeding a striped young one.
- (2) April 12th.—Eight seen.
- (3) April 21st.—Twenty; a red male singing. Two on April 28th.
- (4) In early April a pair were, on several occasions, seen feeding two fully fledged young by Miss J. M. Ferrier, Miss C. M. Acland, P.A.D.H., and other observers.
- (5) One on June 18th.

We suspect that, in addition to the two proved cases of nesting, breeding occurred at other of the above localities.

Mr. Howard Bentham has very kindly informed us of the following Surrey breeding records for previous years: 1898, one pair; 1910, seven pairs; 1926, five pairs; 1927, three pairs.

T. H. HARRISON.

P. A. D. HOLLOM.

CHAFFINCHES CAUGHT IN NEST-LINING.

WITH reference to the notes on this subject (*antea*, pp. 103 and 125), in June, 1930, I was looking through an osier bed near King's Lynn when I heard a great commotion in a bush. On going to see what was wrong I found a young Chaffinch (*Fringilla c. cælebs*) hanging by its tongue to the side of a nest. A piece of wool in the lining had got twisted round the two little spines at the base of its tongue, which was pulled out of its mouth. I managed to disengage the wool, but the bird seemed very exhausted.

N. TRACY.

LARGE CLUTCH OF CHAFFINCH'S EGGS.

At the end of May, 1930, near King's Lynn, I found a nest of a Chaffinch (*Fringilla c. cœlebs*) containing six eggs. On the following morning there were seven eggs in the nest, but no more were laid. N. TRACY.

[In the British Isles the set of seven has been found on seven occasions and Mr. Mayall has once recorded a set of eight (*antea*, Vol. XIII., p. 80), but of course anything over five is quite unusual.—F.C.R.J.]

SCARCE MIGRANTS AT HOLY ISLAND,
NORTHUMBERLAND.

I SPENT from September 8th to 22nd, 1930, at Holy Island, and during that period there was a good deal of migration of small Passeres noticeable. On the 9th the wind went round to the S.E. accompanied by haze, and on the 11th Redstarts and Pied Flycatchers were present in hundreds, while Redbreasts, Willow-Warblers and Goldcrests were very plentiful.

On this day (11th) I identified a Little Bunting (*Emberiza pusilla*). It frequented a hedge near a barley stubble and I saw it again on the 12th and 13th. It was confiding and allowed a close approach, and its small size, chestnut lores and ear-coverts and black streaks on the breast were easily distinguished.

On the same day I watched for some time with my binoculars a Warbler catching insects in some bushes in a garden. From its size, the shape of its bill and its brownish-olive upper-parts and bright yellow under-parts it was certainly an Icterine or Melodious Warbler, the former, *Hippolais icterina*, being, I think, the most likely.

On the 11th I also saw three Bluethroats (*Luscinia svecica*). Two flew to and fro from an embankment to a wall, while the other was hopping about at a great pace on the short grass of a lane. All were catching insects and appeared to be immature birds. T. G. LAIDLAW.

REED-BUNTING SHELTERING YOUNG FROM SUN.

IN Volumes XIII. and XV. of BRITISH BIRDS some photographs of mine were published showing how Sparrow-Hawks protected their young from the sun. Since then I have at various times taken notes on the methods adopted by various



Reed-Bunting shielding Nestlings from Sun.
(*Photographed by J. H. Owen.*)

smaller birds to shield their young from the sun. In July, 1930, I secured some photographs of Reed-Buntings (*Emberiza s. schæniclus*), both male and female, doing this. Their attitudes, which were practically similar, were much more upright than in the Sparrow-Hawk and they did not spread the tail much nor were the wings so fully extended. Even wings in the Reed-Bunting are more widely spread than in any other species I have watched of less size than the Sparrow-Hawk.

The female Reed-Bunting was brooding the young and left the nest on the arrival of the male. After feeding the young and cleaning the nest, he immediately took up a position on the brim of the nest with his back to the sun. At first the spread of his wings was not very great, but this increased as the heat got more powerful until it reached the maximum shown in the lower of the two photographs here reproduced.

J. H. OWEN.

YELLOW-BROWED WARBLER SEEN IN SURREY.

ON October 10th, 1930, in my garden at Sutton, I watched for two or three minutes a Yellow-browed Warbler (*Phylloscopus h. præmius*) which was singing continually its short, shrill, but pleasing little song while it flittered from branch to branch, at first in a plum tree, then to the surrounding trees. I instantly recognized its song, having heard two singing out of four which I watched exactly thirty-five years ago, that were in a hedge of a garden at West Buckland, Devon (also at 10 a.m.), on either October 1st or 2nd, 1895. This bird behaved in a precisely similar way in its actions, by alighting on the lower branches and working its way upwards from branch to branch, and repeating its song every few seconds. A full account with the song set to music of those I saw in Devon is recorded in *British Birds, their Nests and Eggs* (Vol. I., pp. 94-96).

I was able to get quite close to the bird I am now recording. In general form it resembled a small Willow-Warbler, but was not so slim. The pale yellowish brow-streak was distinctly visible and I now and again caught a glimpse of the yellowish bands on the wing-coverts, but these appeared mostly hidden by the overlapping flank feathers. I believe this is the first instance of this rare little Warbler having been observed in Surrey.

F. W. FROHAWK.

SIZE OF SWALLOW BROODS IN CHESHIRE.

I GIVE below a table of the size of broods of Swallow (*Hirundo r. rustica*) near Great Budworth, Cheshire, during the last four years.

It will be seen that the average of the first brood in June is the largest in each of the four years, particularly so during 1930, when the June average was 4.6 nestlings per brood.

The July figures include both first and second broods, but even so are larger than those of August, when there are more broods of one, two and three than in the earlier months.

Broods of six occur rarely—only seven out of 335 broods : four in June, one in July and two in August.

Year	Month	Broods examined and ringed	1	2	Broods of				Average Brood	Total Number of Broods	Average for the Year
1927	June ...	16	—	1	1	5	9	—	4.37	50	3.98
	July ...	5	—	1	—	2	2	—	4.0		
	Aug. ...	28	1	2	5	13	7	—	3.82		
	Sept. ...	1	—	1	—	—	—	—	—		
1928	June ...	22	—	—	5	8	9	—	4.18	71	3.9
	July ...	18	1	1	5	7	4	—	3.66		
	Aug. ...	29	—	2	5	16	5	1	3.93		
	Sept. ...	2	—	1	1	—	—	—	—		
1929	June ...	32	—	1	2	13	16	—	4.37	94	4.06
	July ...	21	—	1	5	9	6	—	3.95		
	Aug. ...	34	1	—	9	16	7	1	3.91		
	Sept. ...	7	—	1	1	4	1	—	3.71		
1930	June ...	33	—	1	3	8	17	4	4.6	121	4.28
	July ...	34	—	1	3	10	19	1	4.47		
	Aug. ...	48	1	2	9	21	15	—	3.97		
	Sept. ...	6	—	—	2	3	1	—	3.83		

A. W. BOYD.

CHOICE OF FIRST NESTING-SITE BY SWALLOWS.

MR. J. F. THOMAS (*antea*, p. 128) gave evidence to show that Swallows after their first winter scatter widely on their return in the district in which they were bred. Such recoveries as have been made of birds I have ringed near Great Budworth, Cheshire, fully bear out his suggestion. Eight marked as nestlings have so far been recovered (four of which have already been recorded in *British Birds*) and, though more recoveries will be needed for definite proof, it is noteworthy that all have been recorded in Cheshire at no great distance.

One of the eight was found in the May of the second summer after ringing $13\frac{1}{2}$ miles to the S.E. The other seven were recaptured in their first summer after ringing ; five certainly, and probably all, were breeding. The five breeding birds were found distant from their original home : $3\frac{3}{4}$ miles S.W., 1 mile S.W., $1\frac{1}{2}$ miles N.W., 1 mile 5 fur. N.E., and 3 fur. N.N.W. The other two were found at a distance of 3 miles N.N.E. and 1 furlong W.

Many other ringed Swallows returned this year to the district and were frequently reported to me from different farms, but in some cases I did not care to try and catch the adults for fear of desertion, as this species is held in high regard locally and protected in practically every farm.

It will be seen, however, that of those recovered none was found in the farm where it was hatched.

There seems to be little chance of their becoming inbred if this scattering be the general rule. A. W. BOYD.

FATAL COLLISION OF SWIFTS.

At Theale Station, Berkshire, there is a large goods shed, open at both ends. Swifts (*Apus a. apus*) nest inside the shed and often fly right through. I have caught a few of them with a large net and ringed them.

On July 24th, 1930, as I am informed by Mr. Stanley the station-master, two Swifts were flying in the same direction, one through the shed and the other outside. The latter, having reached the end of the shed, swung round into it just at the moment when the Swift inside had reached the opening. The two birds collided and fell, and both died as a result about five minutes afterwards. One bore a ring number, 6207, which I had put on eight years before, on May 24th, 1922. NORMAN H. JOY.

GREAT SPOTTED WOODPECKER BREEDING IN SUTHERLAND.

On June 24th, 1930, we heard a Great Spotted Woodpecker (*Dryobates major*) calling in a small plantation on the Sutherlandshire side of Dornoch Firth. On investigation we saw one bird, which was soon joined by another. Above the cries of these two could be heard the shriller voices of young birds. Guided by these, we found the nesting-hole in an old birch. The young were well advanced, and at odd intervals appeared at the entrance hole.

G. K. YEATES.

M. G. ROBINSON.

H. A. PATRICK.

[The Great Spotted Woodpecker was recorded as breeding in south-east Sutherland in 1926 (*antea*, Vol. XX., p. 206), but it is interesting to have a further observation as this is the most northerly point at which it has been noted as breeding. The extension of this bird in northern Scotland during the last twenty years has been remarkable, and within the last ten years it has been recorded as nesting in the counties of Banff, Elgin, Nairn, Inverness, Ross, and, as shown above, south Sutherland.—EDS.]

TAWNY OWL TAKING YELLOW BUNTING.

ON April 20th, 1929, I visited the nest of a Tawny Owl (*Strix a. sylvatica*) near Upper Largo, Fife. In addition to a newly hatched young one and two eggs the nest also contained a number of mice and voles and a male Yellow Bunting (*Emberiza c. citrinella*). Whilst the *Practical Handbook* states that Buntings have been recorded as food of the Tawny Owl, there has apparently been no information as to which species are taken. W. J. EGCELING.

[Newsted recorded a "Bunting" in an analysis of pellets of this species, but though probably *E. citrinella*, the species was not specified.—F.C.R.J.]

BUZZARD BREAKING THROUGH GLASS GREENHOUSE.

ON August 29th, 1930, a Buzzard (*Buteo b. buteo*) forced its way through a pane of glass in the side of a greenhouse adjoining my house. From there it made its way through an open doorway into a corridor of the house, where I found it perched. I opened a door leading into the garden, but the bird, in its alarm, flew through the greenhouse, and, smashing another pane of glass close to where it had entered, made its escape.

Although Sparrow-Hawks have on several occasions been reported as breaking through glass, I am not aware that this has been recorded in the case of the Buzzard. They are not uncommon round this district (Langford, Bow, Devonshire), and one had been seen about a week earlier close to the house, probably the same bird, as both were uniform brown in colour. R. O. JOURDAIN.

HONEY-BUZZARDS IN KENT.

A HONEY-BUZZARD (*Pernis a. apivorus*) was shot on September 17th, 1930, in the vicinity of Rochester. The

bird, which is in immature plumage, proved on dissection to be a female.

A sample of the contents of the crop and stomach was kindly examined and reported upon by Mr. R. B. Benson, of the Natural History Museum, South Kensington, who states that this consisted of pieces of wasp's nest, comb, larvæ, pupæ and immature workers of the common wasp (*Vespa vulgaris*).

The bird was received by me in the flesh from Captain C. W. R. Knight, into whose possession it had passed for identification, and by whose courtesy this note has been made possible.

JAMES M. HARRISON.

A second Honey-Buzzard, which I have seen, was shot on the same day near Snargate, in Romney Marsh. This was also an immature bird, very fat, and its stomach full of wasp-grubs.

N. F. TICEHURST.

OSPREYS IN GREAT BRITAIN.

As an unusual number of Ospreys (*Pandion haliaetus*) have made an appearance in this country this autumn, it is advisable to collect all the details, and we publish below reports we have received, and would refer readers to one already published (*antea*, p. 131). We shall be glad to have any further news of the occurrence of this species. It will be seen that most of the first appearances in different localities occurred in the middle of September, the dates being so near together as to point to the possibility of a number of birds having migrated at the same time. It may be remembered that Capt. C. W. Knight turned out last year in Scotland two young birds from America. We do not know the fate of these birds and we believe they were not ringed, but it is obvious that the present migration has no connexion with these two birds, as has been suggested.

IN ARGYLLSHIRE.—I had an Osprey under observation on Loch Sunart, Argyll, from September 20th until the 23rd, and it was seen by others on the 19th. It apparently spent the day at large, but returned early in the evening to a group of stunted and bent oaks some 600 yards up the hillside from the water. I saw it once, planing and circling at about 150 feet above the bay (September 20th), and also on the 22nd I watched it hovering over the land, as motionless as a Kestrel, with the head slightly down.

A Buzzard flew over on this occasion and so enabled me to make a comparison. The Osprey looks much larger, but

also much less stumpy ; its neck looked distinctly long and its wing-span tremendous. Very wild weather prevailed the next day and I was told that the Osprey was seen to make a very clumsy landing near the shore, but it had disappeared when my informant went out to look for it, nor, I understand, has it been seen since. BRUCE CAMPBELL.

IN ELGIN.—In *The Field* (4-x-30, p. 481) "Ferintosh" states that "recently" he watched an Osprey near Grantown and later on the same day was shown the bird dead. We are informed that it was a bird of the year and the date was September 16th.

OFF THE EAST COAST.—An Osprey, which I kept alive for some days and then despatched to the London Zoological Gardens, was caught, tired out, on board a Yarmouth fishing boat on September 17th, 1930. I have been unable to obtain the exact position of the boat when the bird came on board and can only state that it was between Yarmouth and the Humber.

The bird fed on flounders, whiting, cod's head and other fish ; it also took a great liking to skate skins and bullock's liver. It was thus no trouble to feed and was at no time restless or defiant and only once tried to claw my hand. It appears to be a bird of the year. A. H. PATTERSON.

IN NORFOLK.—The first Osprey seen at Hickling this autumn (1930) was on September 17th and again on the 19th at Horsey Mere.

On September 27th an Osprey again appeared at Hickling. It was seen to make three unsuccessful dives, catching on the fourth, while on the 29th two unsuccessful dives were observed. On October 1st I saw the Osprey come towards a pen of ducks, hover and dive down. I waved my arms to frighten it, and either my action or a view of the wire netting made it take off. On the 6th it again scared a big lot of duck, and I am inclined to think this bird was not averse to taking waterfowl, as I saw it carrying a black object which did not look like a fish, and may have been a duck or Coot, but the bird was just too far off to be certain.

J. VINCENT.

Mr. B. B. Rivière informs us that a bird of the year, now in the Norwich Museum, was shot near Harleston about September 13th and that one was seen at Rockland on the 20th.

Miss M. Barclay informs us that she watched one at Gunton Lake, north-east Norfolk, from October 12th to the 22nd, at which date it appears to have left.

IN SUFFOLK.—An Osprey, which I now have in captivity, was caught in an exhausted state, at Gunton Hall, near Lowestoft, on September 22nd, 1930. This bird is thriving very well on a diet of rabbit and chicken. G. H. GURNEY.

IN SURREY.—On September 19th, 1930, I saw an Osprey in Surrey. It was perching on a dead birch tree by the side of a marsh, on an exposed bit of ground. My attention was attracted by its large size and white head, which could be distinctly seen through field-glasses at a good distance away. It remained on the tree for nearly twenty minutes, during which time I approached to within about 200 yards.

The white head, with black streak across the cheek, white under-parts and thighs, and brown back were clearly seen, and made identification certain. The bird constantly turned its head sharply from side to side, and small birds, as they flew overhead, dipped at it, though it took no notice of them. It then rose, and with deliberate wing-flaps flew away in an easterly direction.

On September 25th, 1927, an Osprey was seen within half a mile of the same place, flying in the same direction.

ENAIID E. JONES.

NESTING OF RED-BREASTED MERGANSER IN DUMFRIESSHIRE.

IN the summer of 1930 I was told that two broods of "Saw-billed ducks" were to be seen daily on the River Nith near Cowhill. It was not, however, till September 12th that specimens of these birds could be obtained, when two were sent to me; these I at once forwarded to Mr. H. F. Witherby who has identified them both as female Red-breasted Mergansers (*Mergus serrator*). Mr. Witherby informs me that, judging from the condition of their sexual organs and from the smallness of their crests, he considers that both birds were hatched this year.

This note should be read in conjunction with Mr. Blezard's record of the breeding of the Red-breasted Merganser on the River Annan (*antea*, Vol. XXIII., p. 132) and my letter on page 232 of the same volume. HUGH S. GLADSTONE.

CURLEW- AND GREEN SANDPIPERS IN SHROPSHIRE.

ON September 7th, 1930, my brother (O. R. Owen) and I went to look for a Green Sandpiper (*Tringa ochropus*) which

had been frequenting some small ponds near Oswestry for more than a month. We saw no sign of it, but at one pond we were greatly surprised to find a Curlew-Sandpiper (*Calidris testacea*). We examined it from close quarters with a powerful pair of field-glasses and put it up several times to watch its flight. Each time it flew a short distance and returned to the pond to rest. It seemed very tired. Later in the day we again watched the bird and approached within twenty feet of it. On this occasion we flushed the Green Sandpiper. I have seen Green Sandpipers in Shropshire in spring, autumn and winter, usually singly, but occasionally in pairs in the winter, but the Curlew-Sandpiper I have never seen in the county before. J. H. OWEN.

LITTLE STINT IN SURREY.

ON September 30th, 1930, at one of the reservoirs near Hammersmith Bridge, my attention was attracted by its size and its short, straight bill to a very small wader, which was feeding, unaccompanied by any other bird. I recognized a Little Stint (*Calidris minuta*), and the bird allowed me to watch it for as long as I wished from a distance of only a few feet. It appeared to be an immature bird.

With the exception that a single bird was reported from the Brent Reservoir in the autumn of 1929 (*antea*, Vol. XXIII., p. 194) this species seems not to have occurred in Middlesex since 1871 (*London Naturalist*, 1929, p. 28). It appears to have been a rare visitor to Surrey, for I am told that in all the volumes of *British Birds* the only record for the county relates to a bird seen by Mr. Howard Bentham at Frensham Pond in 1919 (*antea*, Vol. XIII., p. 220), and that in the *Zoologist* from the beginning of 1900 to the end of 1916 there appears to be no record at all. F. R. FINCH.

GREY PHALAROPE IN SURREY.

ON September 21st, 1930, which was the day after a great gale, I found on one of the reservoirs near Hammersmith Bridge a Grey Phalarope (*Phalaropus fulicarius*) which had nearly, but not quite, completed the change from summer- into winter-plumage. I saw the bird again on September 23rd and 25th; and I am told that on the 27th it had gone.

F. R. FINCH.

ACTIONS OF GREY PHALAROPES IN SOMERSET.

DURING the gale on September 21st, 1930, I had the opportunity of watching four Grey Phalaropes (*Phalaropus fulicarius*)

carius) which were feeding on a saltings near Burnham. They were extraordinarily tame and would allow me and three dogs to approach within three yards. They were feeding greedily in the small, muddy pools, and at frequent intervals they would sit down for a few seconds in the mud and continue feeding while sitting. The high wind may have accounted for this, as on the 25th I watched three of these birds in the same place and they never sat down while feeding. Their walk was rather ungainly, with feet rather wide apart, more like a duck's walk. When approached too close they uttered a high-pitched but soft "chip", but otherwise were silent. I saw the last of the party on September 28th. E. G. HOLT.

SANDWICH TERNS IN ESSEX.

IN *A History of the Birds of Essex*, Mr. W. E. Glegg states that the Sandwich Tern (*Sterna s. sandvicensis*) "is now recorded only on very rare occasions while on migration", and the only dated record since 1876 is of one seen at Harwich on April 24th, 1927. It is therefore worth recording that on August 31st, 1930, when with other members of the London Natural History Society, a flock of at least 200 Sandwich Terns was seen on Mucking Flats. They were chiefly congregated on and about a few lumps and posts protruding from the mud. Several flew from down-river to the flock, a few feeding, plunging into the shallow water; the others alighted among the resting birds.

L. PARMENTER.

H. A. LITTLEJOHN.

LAND-RAIL'S ACTIONS WHEN CALLING.

DURING the latter half of May, 1929, at Pooley Bridge, Westmorland, I had a good opportunity of watching a Land-Rail (*Crex crex*) "creaking". There were about five pairs within a radius of a quarter of a mile from the hotel where I was staying. I located a pair in a meadow of short grass and spent many hours watching them. Upon hearing the creaking I would fix my glasses on the spot from which the sound came, and could see the bird with its head and neck stretched above the grass, its beak wide open and held at an angle of about 45 degrees. It appeared to keep its beak open all the time and moved its head slowly from side to side; then it would leave off creaking and slowly submerge. After an interval of about five minutes it would again raise its head above the grass either in the same place or a little further off and repeat the performance.

N. TRACY.

MOORHENS KILLING HOUSE-MARTIN.

I WAS recently watching a pair of Moorhens (*Gallinula ch. chloropus*) which had a nest containing eggs and a brood of half-grown young on a pond at Tadworth, Surrey.

Greatly to my astonishment, both the adult Moorhens made a savage attack upon a House-Martin (*Delichon u. urbica*) which was one of a party of four engaged in collecting mud at the side of the pond.

The male Moorhen, after feeding the female at the nest, immediately swam to the edge of the pond, and seizing one of the Martins with its bill, shook it violently before dropping it into the water and delivering a number of sharp blows with the beak. The female then joined in the attack, but by this time the Martin appeared to be almost lifeless, and after striking a few more blows the aggressors swam away. A minute or two later the unfortunate victim commenced to struggle feebly, when both Moorhens at once resumed the attack.

I hurried to the spot in the hope of rescuing the Martin but it appeared to have been trampled under the deep mud, as I could discover no trace of it.

I should mention that the pond is a very small one, and as the Moorhens were the only birds nesting there, it would appear that the question of territorial rights is the only possible explanation of such extraordinary behaviour.

HOWARD BENTHAM.

YOUNG CUCKOO FED BY WREN.—Mr. T. G. Powell writes that on July 19th, 1930, in Staverton Park, east Suffolk, he watched a Wren (*Troglodytes t. troglodytes*) feeding an almost fully-grown young Cuckoo (*Cuculus c. canorus*). This is some evidence that the Cuckoo was reared by the Wren, but as birds other than the real foster-parents frequently feed young Cuckoos, the evidence is not conclusive.

GLOSSY IBIS IN HAMPSHIRE.—Mr. F. W. Frohawk states (*Field*, 27. ix. 1930, p. 444) that a specimen of *Plegadis falcinellus* was shot in the Christchurch marshes on October 26th, 1929. Mr. Frohawk gives a drawing of the specimen which was lent to him by Mr. D. C. Johnstone, the present owner of it.

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NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U.

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BREEDING OF THE BLACK-NECKED GREBE IN IRELAND.

BY

C. V. STONEY AND G. R. HUMPHREYS.

THE history of the Black-necked Grebe (*Podiceps n. nigricollis*) as a breeding species in Ireland is somewhat of a mystery. The first definite breeding record would appear to date from 1915 (*Brit. Birds*, Vol. IX., p. 125), being based on the receipt by Mr. W. J. Williams, the well-known Dublin naturalist, from one of the western loughs, of a young bird shot on August 24th. On June 18th, 1918, Mr. Williams received, in the flesh, a pair of these Grebes in full summer plumage, with three young in down. These specimens now form a family group in the National Museum, Dublin (*ibid.*, Vol. XIV., p. 210). For several years prior to 1921 this species was known to breed in at least one locality by two observers, who have both since died—Dr. Darling of Lurgan, and his brother, Mr. Ffolliott Darling, who, in 1922, informed Stoney that he had seen four nests with eggs at this place the previous year (*ibid.*, Vol. XVI., pp. 295-6). The locality was not divulged, and it was not until 1929 that the present writers, after years of careful search—no easy task when we consider the innumerable loughs scattered over the central and western plain of Ireland—discovered a considerable breeding colony of Black-necked Grebes on a secluded lough. A brief announcement of this discovery was made in November, 1929 (*Bull. Brit. Oological Assoc.*, No. 24, 1929).

On April 26th, 1929, this lough—previously selected as likely to solve the mystery—which is between two and three miles in length, and about half a mile at its widest point, and is situate in a remote part of the midlands, was visited by Humphreys. As soon as he arrived at the lough side he was delighted to see a Black-necked Grebe in full breeding plumage swimming about twenty yards off the shore. The best part of the day was spent in a careful examination of a large bed of rushes, whose broken-off stems were about nine inches above the surface of the water. About fifty Black-necked Grebes were seen, chiefly in ones and twos; one female and a pair of Great Crested Grebes (*Podiceps c. cristatus*) and one Little Grebe (*Podiceps r. ruficollis*) but no nests were found in this bed.

The tameness of the Black-necked Grebes was remarkable. A single bird was, on one occasion, seen to approach a pair on the water, one of which, apparently the male from its slightly larger size, showed distinct objection to its intrusion.

A second visit, on May 22nd, 1929, was most disappointing. Heavy driving rain set in, and although Black-necked Grebes were seen it was not possible, owing to the prevailing conditions, for further exploration to be carried out.

On June 1st and 2nd, 1929, both observers spent two days in the locality. On the first day the large bed already referred to was examined but failed to produce any nests; although the three species of Grebe were seen, the Black-necked predominating, it was not until late in the afternoon that the first breeding colony of Black-necked Grebes was discovered.

The birds were found to be nesting in clumps of sedges, bog bean, etc. In the first of these clumps were found eleven nests of Black-necked Grebes, two containing 4 eggs each, eight with 3 eggs, and one with 2 eggs. Some of these eggs, including the two fours, and the set of two, were obviously hard set. Another similar but smaller clump produced five nests of Black-necked Grebe, one with 2 eggs, the others with 3 eggs. Many of the birds were to be seen swimming about, some accompanied by young. One or two pairs of Little Grebes, and several Great Crested Grebes, were seen on the water; one nest of the latter which was examined contained 5 eggs.

On the next day this section of the lough was again visited. In another of these sedge clumps, about 15 yards by 12 yards, the following census of nests of Grebes was taken, the figures denoting the number of eggs in each nest, the individual numbers representing separate nests; these being set out in the order of examination from a fixed point.

Black-necked Grebe	2, 2, 2, 3, 3, 3, 3, 2, 2, 3, 3, 2, 3, 2.
Little Grebe	... 3.
Black-necked Grebe	3, 3.
Great Crested Grebe	3, 3.
Black-necked Grebe	3, 3, a nest with 1 egg hatching, 2, 3, 2, 2, and several nests from which the young had gone.

Another clump produced:—

Black-necked Grebe	2, 3, 3, 2, 3, 2, 2, 3, 2, 3, 2.
Great Crested Grebe	4.
Black-necked Grebe	2, 3, 3.
Great Crested Grebe	3.
Black-necked Grebe	3, 3, 3, 3, 3, 3, 3, 3, 0, 2.
Little Grebe	... 2.
Black-necked Grebe,	2.
Great Crested Grebe	3.

In a much smaller sedge clump, or more strictly a large tuft, were three nests of the Great Crested Grebe, one containing 1 egg, one with 4 eggs, and the other with 4 eggs of the rightful owner and a Coot's (*Fulica a. atra*) egg. There was also a Little Grebe's nest here with 5 hard-set eggs.

These results were only obtained after a considerable amount of hard work and time occupied in rowing, wading, and careful searching. Owing to lack of time, further investigation for that season was not possible.

On May 22nd, 1930, and two following days the lough was revisited, two well-known field ornithologists being present part of the time, Humphreys again spending one day there. A very large breeding colony of Black-necked Grebes was found at the head of the lough in a dense reed bed several acres in extent, with reeds eight feet in height, and protected on all sides by a mass of floating vegetation. In addition there were several separate groups of nests in isolated clumps of sedge, etc., growing out of the water not far from the main reed bed now referred to; these were the clumps examined in 1929. In these various groups it was estimated that about two hundred and fifty pairs of Black-necked Grebes were nesting. In the dense reed bed the nests were only a few feet apart, while some of those in the isolated clumps touched each other. A certain definite section of this huge reed bed was densely occupied. The method of counting was to expose the eggs, by lifting off the covering vegetation, in nests at fixed points and to count the nests lying within the sections thus formed. Elsewhere, Great Crested and Little Grebes had matters to themselves, the former being extremely abundant. The Black-necks, however, really left no room for strangers in their own townships.

The nests, were large untidy structures, more than half submerged, and never looked so finished as those of the Little Grebe. The usual set of eggs was three, but many nests held four, and one with five eggs was seen. The eggs are distinguishable at a glance from those of the Little Grebe, as they are usually longer and invariably wider. At this date most of the eggs seemed to be half incubated, but a few young were to be seen, beautiful little objects, their backs striated with black and grey. Some were to be seen riding on the backs of their parents.

In the dense reed bed the sitting birds disappeared completely at the approach of an intruder, but in the outer clumps dozens of Black-necked Grebes might be seen at close

quarters issuing from their shelter and "taxi-ing" over the surface of the water.

It is a matter of extreme difficulty, not unattended with a certain amount of risk, to wade through these nesting haunts of the Black-necked Grebe, owing to the treacherous nature of the overgrown drains which intersect the reed bed, but one is well repaid for any personal discomfort.

There is a strong probability that this is not an isolated breeding-ground of the Black-necked Grebe in Ireland. Both observers saw single pairs or solitary birds in two other localities, and this species has been noticed on at least one lough in co. Mayo in June, so that it is probably more widespread than is suspected. These Grebes appear to prefer loughs which have grassy bottoms, and to avoid those that are bare and rocky. Further careful search would probably add considerably to our present knowledge of the distribution of this interesting species in Ireland.

ITS STATUS AS A BREEDING BIRD IN GREAT BRITAIN.

[The astonishingly large size of the colony of which Mr. Stoney and Mr. Humphreys give details above makes this one of the most important discoveries of recent years in connexion with the ornithology of the British Islands.

The question must now arise whether the birds found breeding in Wales, more recently near Tring and still more recently in Scotland, have spread from the west, or, as has been supposed up to now, from the Continent. Unfortunately, it is not known how long this remarkable Irish colony has been in existence, but to have attained such dimensions it must surely have been established for a considerable time. It is curious that the Black-necked Grebe is seldom reported at any time of year from other parts of Ireland. In Ussher's *List*, published in 1908, only twenty-four records of the bird's occurrence were known, and since that date the bird has been reported only on rare occasions outside its breeding area.

As it will be of interest in connexion with the news from Ireland to consider the attempts of the Black-necked Grebe to establish itself in Great Britain, I give below short histories of the Welsh and Hertfordshire birds, for details of which

I am indebted to several ornithologists, and especially to Mr. Charles Oldham, and brief details of Mr. Connell's discovery in Scotland, which has not previously been referred to in our pages.

IN THE FORTH AREA.

Mr. C. G. Connell makes the interesting announcement that he has discovered Black-necked Grebes breeding in the Forth Area (*Scott. Nat.*, 1930, pp. 105-109). In 1928, on June 30th, and until the middle of July, a single Black-necked Grebe was seen on a loch. In 1929, on May 12th, two (obviously a pair) were seen, and on June 3rd six birds which on the 11th were in two pairs and two single birds. Considerable areas of reeds, buckbean and coarse grass afforded shelter for nests, but much of the ground was treacherous and practically inaccessible. No nest was found, and on July 5th, 7th and 14th no birds were seen and Mr. Connell concluded that young at any rate had not been brought off successfully.

In 1930 one bird was seen on May 3rd and on the 29th there were definitely three pairs. On May 19th a nest was found, but three days later it had disappeared. On July 27th a third smaller bird with a pair was considered to be a juvenile and on the 30th two pairs were observed with young on their backs, one brood being three or four days old and the other considerably older.

IN WALES.

The Welsh colony seemed to be well established, but recent reports are very disappointing and it would appear that the place is now deserted. It was first discovered in 1904, when five pairs with young were observed, as announced by Mr. O. V. Aplin (*Zool.*, 1904, pp. 417-420). The names of the discoverers were withheld, but it can do no harm to mention now that they were Mr. C. Oldham and Mr. S. G. Cummings. There is evidence to show that the birds were in this district twelve years prior to 1904. In 1910 there were at least four pairs, in 1917 two old and three young were seen, in 1923 several old birds were seen. In 1926 no Black-necked Grebe could be seen, but in 1927 one pair was reported as breeding in a locality which was doubtless this one.

Several ornithologists who visited the place in 1928 and 1929 were unable to see any Black-necked Grebes there after prolonged search.

IN HERTFORDSHIRE AND BUCKINGHAMSHIRE.

The history of the Black-necked Grebes which nested at the Tring Reservoirs first in 1918 shows that there are some conditions which militate against their becoming established in this area. Mr. C. Oldham's yearly reports to the *Transactions Herts. Nat. Hist. Soc.* show that in 1919 only two pairs brought off young. [One young was also hatched this year in another locality.] In 1920 a pair nested and were photographed by Mr. O. Pike, and there is some evidence that two pairs were present, but we believe no young were hatched. In 1921 there were two pairs, one of which had two young. In 1922 two pairs were seen, but no young. From 1923 to 1927 only single birds were seen and it was not until 1928 that they nested again, but then only one pair, which had only one young, and this disappeared. Both in 1929 and 1930 a pair was seen and possibly nested, but in any case no young were hatched.—H.F.W.]

FIELD-NOTES ON THE SUBALPINE WARBLER.

BY

JOHN ARMITAGE.

(Plate 2.)

ON June 5th, 1928, in the Sierra de Aracena, province of Huelva, S. Spain, I found a nest of the Subalpine Warbler (*Sylvia c. cantillans*) with one fresh egg, and a few feet away a similar nest which had been occupied recently by young. Two days later a nest with five eggs was found and close by was a second in identical state as the used nest seen on June 5th, suggesting that this species is double-brooded.

During 1930 I spent some time with breeding Subalpine Warblers in the locality mentioned: from May 1st to June 18th, with two breaks—June 1st to 5th in the Sierra Morena, and June 9th to 13th in the Sierra Nevada—and in all three places these warblers were nesting. Although it was a late season I missed the courtship period, but had many opportunities of seeing and hearing the cocks in song. The most conspicuous action was a flight into the air, the song being uttered as the bird rose and fell, but it also sang while fluttering bat-like in a curve from one vantage-point to another, and also occasionally when perched on a high spray among the scrub. The song was lively and clear, reminding me somewhat of the song of the Whitethroat (*Sylvia c. communis*), but sweeter and more prolonged. Often, from my photographic tent, I heard the cock singing while its mate was feeding young, and, when perched very close to the tent, it frequently warbled in a sweet, but subdued tone, as if singing to itself.

The birds under observation in the Sierra de Aracena had the scrub to themselves, excepting in the gullies, where a few pairs of Nightingales (*Luscinia m. megarhyncha*) were nesting among the oleanders. On May 5th I knew of ten nests of the Subalpine Warbler, comprising three built in gorse with five eggs, four eggs, and four young; two nests in cistus with four eggs, and three young; one nest in rush with three young and one egg; one nest in a small stone-pine with five eggs, and three empty nests. None of the empty nests were laid in, and later I looked up my notes relating to their discovery. Two were found by noticing singing and excited cocks above the nests, and the third by flushing a cock from a clump of gorse. I felt convinced that these nests were built by cocks while their mates were incubating eggs, and deserted soon after being made.

By May 10th I was dismayed to find that five of the seven tenanted nests had come to grief. It was impossible to determine the cause. Rodents, snakes, and eyed-lizards may have been to blame; a prowling Spanish Magpie (*Pica p. melanota*) or Azure-winged Magpie (*Cyanopica c. cooki*) might have been the culprit, and I mistrusted a red-throated lizard about ten inches long which literally swarmed among the palmetto and shorter scrub. And there was always the chance of a nest being pushed over by the herds of browsing goats which passed through the tangled bushes every few days. For comparison, I gathered these five useless nests and the three cock-nests and found that they grouped into three distinct types: firstly, a bulky and well-made grass-nest from gorse; secondly, a small and more compact structure from a branch of cistus and—like the first—lined with fine grass, wool and goat-hair; and thirdly, the cock-nest type, deep, but flimsy, and without lining.

But I was fortunate in settling on an isolated pair of Warblers in a disused quarry carpeted with rush and semi-aquatic vegetation, with an oleander-margined stream passing through it. Their nest (found on May 2nd) was built among the rush and oleander; it was well screened from above, and as goats and red-throated lizards were not present, the prospects seemed good. When discovered, the nest contained four chipped erythristic eggs, and by mid-day three young were hatched and the fourth died in the shell. On May 14th three fledged young left the nest of their own accord. A second nest was commenced eight feet from the first in a similar situation on May 20th; one egg was laid on May 25th, and incubation began on May 28th, when four eggs (also erythristic) were laid. These eggs hatched on June 8th, and on June 18th the young were eleven days old, well-feathered, but still in their nest. While in the Sierra Morena and Sierra Nevada during the two periods in June, I found nests which tallied with the state of eggs and young of my quarry nests, and I think from this that the species is normally double-brooded.

The hen sits closely on its nest and eggs, and flies away silently when flushed, but usually returns soon afterwards. I never saw a cock close to a nest containing eggs. When young are in the nest, both cock and hen scold persistently while skulking among the bushes, and in the Sierra Morena I was on two occasions drawn to nests by their owners scolding close to the nesting-site while I was standing several feet away. The angry hen calls rapidly "chat-chat-chat-chat"

and "ch-ch-ch-ch", whilst an excited cock will call "chit-chit-chit-chit" and will creep very close to the intruder. At a nest containing fledglings the hen acted in a remarkable manner while the young were being handled. It fluttered among the plant-stems and over the ground close to my feet with wings and tail outspread and head held out in front, gliding along as if driven by clockwork. Towards the end of May I came across little parties of from two to four young in charge of adult cocks—hunting among the oleanders and rank vegetation in the gullies, and presumed in these instances that the hens were incubating second clutches of eggs.

It was difficult attempting to identify the food brought by the adults to their nestlings while curled up in my tent; the furtive actions of the birds and smallness of their prey, combined with the choking heat and a mob of buzzing flies seeking an outlet from the hide had a numbing effect on the senses. Small green moth-larvæ were often brought, and fragments of moth-wings below the nest suggested lepidoptera besides the diptera and other winged insects impossible to classify from a distance of four feet. All the food was picked from plants close to the nest; the cock only fed the young on rare occasions and no doubt objected to the close proximity of my tent. I never saw the adults fly out to an insect on the wing.

The eggs were of two forms in coloration: drab, pale buff or greenish with brown and grey spots; and white or pink with reddish spots and small frecklings. In a nest with three young (Sierra Nevada, June 10th) I found a pure white and unspotted egg. Unlike many warblers which produce smaller sets of eggs when laying for second broods, the Subalpine invariably lays four or five eggs showing a better average than with earlier clutches, and three seems to be the usual number of young reared from a nest.

A nestling aged three days is without down; skin greyish-purple on head and back, legs pale flesh and bill brown; mouth and tongue orange-yellow with two brown spots on tongue, and gape-flanges externally are pale yellow. The spots on the tongue are less distinct when the bird is ten days old. The iris is brown and the eyelid olive-brown, the latter contrasting greatly with the orange-red of the adult eyelid. My notes from the nests under observation show that the eggs are laid daily; the incubation-period is 11–12 days; the fledging-period 11–12 days, and from the pair of birds in the quarry I form an estimate of 63 days from the laying of the first egg of the season (April 18th, approximately) to young of second brood leaving the nest (June 19th approximately).



SUBALPINE WARBLER.

Upper—Hen shielding nestlings from sun and gasping in heat (note
rietal bristles).

Lower—Cock bird at nest.

(Photographed by John Armitage.)



RECOVERY OF MARKED BIRDS.

No.	Place and Date Ringed.	Place and Date Recovered.
RAVEN (<i>Corvus c. corax</i>).		
105295	Kirkconnel (Dumfries.), 6.4.29, young, by T. K. Craven and W. Bone.	Near Moffat (Dumfries.), end March, 1930, by W. Anderson.
105294	Ditto 6.4.29.	Kirkcowan (Wigtown.), April, 1930, by <i>The Field</i> .
CARRION-CROW (<i>Corvus c. corone</i>).		
79181	Ochil Hills (Perths.), 18.5.29, young, by W. Davidson.	Loch Leven (Kinross.), 12.5.30, by W. Telfer.
79182	Ditto 18.5.29.	Near Dunkeld (Perths.), 14.4.30, by G. A. Keir.
73831	Wooler (Northumb.), 20.5.29, young, by W. J. Eggeling.	Powburn (Northumb.), early April, 1930, by R. F. Allgood.
RS.647	Hawes (Yorks.), 31.5.29, young, by C. J. Buchan and J. E. M. Sumner.	Where ringed, 6.5.30, by J. W. Astley.
ROOK (<i>Corvus f. frugilegus</i>).		
RR.3642	Charing (Kent), 17.4.30, by W. Stephen-Jones.	Near Chatham, 22.8.30, by H. Gurr.
RR.3632	Near Canterbury (Kent), 8.5.29, young, for St. Edmund's School N.H.S.	St. Osyth (Essex), 10.4.30, by J. T. Keeble.
JACKDAW (<i>Colæus m. spermologus</i>).		
RR.4424	Near Gt. Budworth (Ches.), 26.6.28, ad., by A. W. Boyd.	Warrington (Lancs.), 17.4.30, by S. Jenkins.
RR.4440	Ditto 5.2.29.	Near where ringed, 15.6.30, by A. Boumphray, per ringer.
RR.7262	Near Great Comberton (Worcs.), 24.5.28, young, by A. C. Smith.	Near where ringed, 19.4.30, by F. Taylor.
RS.3606	Malvern (Worcs.), 29.5.30, nestling, by W. A. Cadman.	Between Ross and Hereford early Nov., 1930, by R. T. Powell.
MAGPIE (<i>Pica p. pica</i>).		
73902	Near Wells (Som.), 13.5.29, young, by C. R. Stonor.	Where ringed, 2.6.30, by H. S. Lumber.
JAY (<i>Garrulus g. rufitergum</i>).		
RR.4475	Hickling (Norfolk), 14.7.29, nestling, by A. W. Boyd.	Where ringed, 8.7.30, by J. Vincent.
STARLING (<i>Sturnus v. vulgaris</i>).		
H.7631	Kirkwall, Orkney, 3.5.29, ad., by D. J. Robertson.	Where ringed, 23.7.30, by H. C. Jenkins, per ringer.
T.5445	Broughty Ferry (Forfar.), 19.2.29, by T. L. Smith.	Near Dundee, 26.5.30. by Mrs. Balharry.

<i>No.</i>	<i>Place and Date Ringed.</i>	<i>Place and Date Recovered.</i>
STARLING (<i>continued</i>).		
W.5830	Broughty Ferry (Forfar.), 21.12.27. by T. L. Smith.	Glamis (Forfar.), 17.5.30, by J. Keillor.
V.4914	Near Dundee, 27.4.28, ad., by E. C. Sharp.	Where ringed, 17.5.30, by ringer.
H.8584	Near Largo (Fife.), 25.5.29, nestling, by W. J. Eggeling.	Ditto 16.8.30.
X.2384	Carlisle (Cumb.), 23.12.25, ad., by J. N. D. Smith.	Where ringed, 20.3.30, by ringer.
X.3279	Ditto 4.9.26.	Ditto 29.5.27; 29.11.27; 25.5.30.
X.3963	Ditto 20.2.28	Ditto 30.5.28; 14.1.30.
V.9121	Ditto 6.9.28.	Ditto 1.3.29; 24.5.30.
V.9131	Ditto 20.9.28.	Ditto 24.5.30.
V.9142	Ditto 29.9.28.	Ditto 15.3.30.
V.9153	Ditto 10.10.28.	Ditto 21.2.30.
V.9188	Ditto 15.12.28.	Ditto 21.5.30.
V.9397	Ditto 26.3.29.	Ditto 9.11.29.
V.9412	Ditto 5.5.29.	Ditto 20.3.30.
V.9427	Ditto nestling, 5.6.29,	Ditto 10.2.30.
V.9429	Ditto ad., 9.11.29,	Ditto 25.5.30.
V.9443	Ditto 23.12.29	Ditto 25.5.30.
X.3996	Ditto 13.4.28.	Ditto, 31.3.30, by J. T. Robinson.
V.9356	Ditto 20.2.29.	Ditto, 23.5.30, by H. J. Ward.
V.9352	Ditto 19.2.29.	Ditto, 21.5.30, by Mrs. Lloyd.
V.9428	Ditto 28.10.29.	Ditto, 30.5.30, by E. Irving.
V.9132	Ditto 20.9.28.	Ditto, 12.6.30, by A. Bryan.
V.9458	Ditto 5.1.30.	Ditto, 15.6.30, by W. Huggon.
V.9238	Ditto 4.1.29.	Ditto, 22.6.30, by A. Howe.
V.9339	Ditto 12.2.29.	Annan (Dumfries.), 28.6.30, by J. Dickson.
V.9291	Ditto 22.1.29.	Scaleby (Cumb.), May, 1930, by W. Telford.
Y.1969.	Formby (Lancs.), 6.12.28, ad., by T. L. S. Dooly.	Where ringed, 4.8.30, by J. Baker.
T.4429	Near Gt. Budworth (Ches.), 21.5.29, nestling, by A. W. Boyd.	Where ringed, 17.11.29, by ringer.
T.4346	Ditto ad., 3.3.29.	Near where ringed, 20.11.29, by Mr. Birkenhead.
X.2992	Ditto 27.11.26.	Beeston (Notts.), 7.5.30, by P. Price.
S.4426	Ditto 17.11.29.	Driebergen, Holland, 28.6.30, by M. T. Blom.
Y.8684	Cheadle (Staffs.), 3.12.25, ad., by J. R. B. Masefield.	Tean (Staffs.), 5.8.30, by ringer.
U.2796	Malvern (Worcs.), 17.1.29, ad., by P. E. A. Morshead.	Where ringed, 23.5.30, by ringer.
V.6766	Ditto young, 30.6.27.	Saul (Glos.), 7.5.30, by T. W. Maule.

No.	Place and Date Ringed.	Place and Date Recovered.
STARLING (<i>continued.</i>)		
T.5885	Hemsby (Norfolk), 26.2.29, ad., by J. M. Ferrier.	Near Tilsit (E. Prussia), Oct., 1930, by K. Stoermer.
X.8223	Ingatstone (Essex), 25.5.26, young, by B. Clark.	Where ringed, 1929, by C. H. Cannon.
X.4084	Godalming (Surrey), 28.5.28, ad., by W. P. G. Taylor.	Where ringed, 1.10.30, by ringer.
S.4150	Canterbury (Kent), 31.5.29, young, by H. Jacob.	Near where ringed, June, 1930, by T. M. Osborne.
Y.5572	Near Worthing (Sussex), nestling, 24.5.26, for Lond. N.H.S.	Where ringed, 18.5.30, by ringer.
T.5796	Brighton (Sussex), 25.2.29, ad., by C. W. G. Paulson.	Dornbusch, Rugen, Germany, 26.7.30, by J. Becker.
V.9732	Salisbury (Wilts.), 13.1.29, ad., for Oxford Orn. Soc.	Tisbury (Wilts.), March, 1930, by H. Martin.
V.6841	Branscombe (Devon.), 30.12.27, ad., by P. E. A. Morshead.	Near Antwerp (Belgium), 18.10.29, by V. van Straelen.

GREENFINCH (*Chloris c. chloris*).

F.8973	Near Gt. Budworth (Ches.), 14.2.28, ad., by A. W. Boyd.	Where ringed, 1.1.30, by ringer.
H.3787	Ditto 23.12.28.	Ditto 12.1.30.
H.3788	Ditto ditto.	Ditto, three times Jan., 1929; 16.5.29; 12.1.30.
H.3826	Ditto 6.1.29.	Ditto 3.3.29; 8, 17.3.30.
H.4059	Ditto 12.3.29.	Ditto 2.2.30.
H.5452	Ditto 17.5.29.	Ditto 13.5.30.
H.5384	Ditto 18.5.29.	Ditto 2.2.30.
H.5513	Ditto 11.6.29.	Ditto, 30.6.29; 4, 8.7.29; 24.3.30.
G.5492	Oxford, 15.1.29, ad., for Oxford Orn. Soc.	Where ringed, April, 1930, by S. Hewlett.

LINNET (*Carduelis c. cannabina*).

J.8749	Eton (Bucks.), 25.5.30, nestling, by G. B. Blaker.	Vieux-Boucan (Landes), France, 16.10.30, by M. Mague.
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CHAFFINCH (*Fringilla c. caelebs*).

H.4957	Kirkmahoe (Dumfries.), 7.1.29, ad., by W. and A. B. Duncan.	Where ringed, 4.4.30, by ringer.
D.4573	Ulverston (Lancs.), 24.6.27, ad., by C. F. Archibald.	Ditto 24.7.30.
G.6561	Near Gt. Budworth (Ches.), 9.6.28, ad., by A. W. Boyd.	Ditto 8.4.30.
H.4519	Malvern (Worcs.), 22.1.29, ad., by P. E. A. Morshead.	Where ringed, 12.6.30, by ringer.
G.6930	Polegate (Sussex), 15.1.29, ad., by W. A. Cadman.	Where ringed, 26.5.30, by C. G. Hunt.

No.	Place and Date Ringed.		Place and Date Recovered.	
TREE-SPARROW (<i>Passer m. montanus</i>).				
F.9053	Near Gt. Budworth (Ches.), 20.5.28, ad., by A. W. Boyd.	Where ringed, 19.7.30, by ringer.		
H.5669	Ditto nestling, 29.6.29.	Ditto		26.6.30.
H.5717	Ditto 12.7.29.	Ditto		6.7.30.
H.5826	Ditto 12.8.29.	Ditto		6.6.30.
YELLOW BUNTING (<i>Emberiza c. citrinella</i>).				
D.5251	Near Gt. Budworth (Ches.), 12.6.26, ad., by A. W. Boyd.	Where ringed, 9.6.29; 22.7.30, by ringer.		
SKY-LARK (<i>Alauda a. arvensis</i>).				
G.6583	Near Gt. Budworth (Ches.), 15.6.28, ad., by A. W. Boyd.	Where ringed, 17.4.30, by ringer.		
MEADOW-PIBIT (<i>Anthus pratensis</i>).				
J.1283	Blakeney (Norfolk), 22.8.29, young, by T. H. and W. R. Harrisson.	Near same place, 24.9.30, by E. C. Arnold.		
H.4428	Cley (Norfolk); 21.5.30, young, by R. M. Garnett.	Morthory (Basses Pyrénées), 6.10.30, by M. Paul.		
NUTHATCH (<i>Sitta e. affinis</i>).				
H.7786	Hele (Devon.), 11.4.29, ad., by J. M. Hepburn.	Where ringed, 17.4.30, by ringer.		
WHITETHROAT (<i>Sylvia c. communis</i>).				
G.6271	Ullswater (Cumb.), June, 1928, young, by H. J. Moon.	Where ringed, May, 1930, by E. Dawes.		
SONG-THRUSH (<i>Turdus ph. clarkei</i>).				
R.6503	Kinnoull Hill (Perth.), 21.5.30, young, by J. Ritchie.	Lasseube (Basses Pyrénées), France, 12.10.30, by A. Cabarrony.		
Y.2134	Helensburgh (Dumbarton.), 7.5.25, nestling, by T. Kerr.	Row (Dumbarton.), 27.4.30, by H. Taggart.		
V.1053	Kirkmahoe (Dumfries.), 30.4.27, nestling, by W. and A. B. Duncan.	Perth., 30.3.30, by M. Martin.		
V.9398	Carlisle (Cumb.), 26.3.29, ad., by J. N. D. Smith.	Where ringed, 25.5.30, by ringer.		
V.9263	Ditto 14.1.29.	Ditto		25.5.30.
V.3021	Penrith (Cumb.), May, 1927, young, by H. J. Moon.	Tralee (Kerry), 10.3.30, by T. Kerins.		
T.3210	Ingleton (Yorks.), July, 1928, young, by H. J. Moon.	Where ringed, 13.4.30, by W. Clement.		
W.5433	Near Gt. Budworth (Ches.), 18.12.27, ad., by A. W. Boyd.	Where ringed, 15, 21.1.29; 17, 25.2.29; 19.7.30, by ringer.		

No.	Place and Date Ringed.	Place and Date Recovered.
SONG-THRUSH (<i>continued.</i>)		
T.4316	Near Gt. Budworth (Ches.), 23.2.29. ad., by A. W. Boyd.	Where ringed, 21.2.30, by ringer.
T.4371	Ditto 18.3.29.	Ditto 20.12.30.
T.6073	Ditto nestling, 7.6.29.	Near where ringed, 8.8.30, by ringer.
X.9848	Prestbury (Ches.), 8.5.27, nestling, by R. M. Garnett.	Cheadle Hulme (Ches.), 3.11.30, by S. Standing.
V.1975	Hemsby (Norfolk), 1.5.27, young, by J. M. Ferrier.	Ormesby (Norfolk), 27.6.30, by C. Clarke.
Z.3936	Benacre (Suffolk), 15.4.25, young, by C. Wingfield.	Near Bouillon, S.E. Belgium, Oct., 1925, by V. van Straelen, Director Musée Roy. d'Hist. Nat.
T.4756	Woodford Green (Essex), 27.2.29, ad., for Lond. N.H.S.	Where ringed, 6.3.29: 30.3.30.
T.9486	Canterbury (Kent), 4 5.29, young, for St. Edmund's School N.H.S.	Ditto, 8.7.30, by W. Woollett.
Y.8972	Beenham (Berks.), 25.6.26, nestling, by E. G. Corbet.	Reading, June, 1930, by J. L. Hawkins.
BLACKBIRD (<i>Turdus m. merula</i>).		
V.9058	Broughty Ferry (Forfar.), 14.12.28, ad., by T. Leslie Smith.	Near Dundee, 1.4.30, by W. McFarlane.
U.9523	Falkirk (Stirling.), 14.2.29, ad., for Oxford Orn. Soc.	Where ringed, 6.4.30, by A. Smith.
T.2620	Kirkmahoe (Dumfries.), 28.5.29, nestling, by W. and A. B. Duncan.	Where ringed, 25.3.30, by W. Duncan.
T.2661	Ditto ad., 30.12.28.	Ryfylke, near Stavanger, Norway, 15.4.30, by H. Hysten.
V.9144	Carlisle (Cumb.), 4.10.28, by J. N. D. Smith.	Where ringed, 16.3.30, by ringer.
V.9441	Ditto ad., 22.12.29.	Ditto 13.4.30.
V.9177	Ditto 9.12.28.	Ditto 12.2.29; 4.4.30.
V.9176	Ditto 4.12.28.	Ditto 25.5.30.
U.4726	Carlisle, 29.4.28, young, by H. J. Moon.	Near Penrith (Cumb.), 8.4.30, by W. Howe.
W.6610	Penrith (Cumb.), May, 1927, young, by H. J. Moon.	Near where ringed, 17.3.30, by Mr. Anderson.
G.6177	York, 23.5.28, young, by H. J. Moon.	Where ringed, 27.6.29, by G. Patterson.
X.8293	Stocksfield (Northumb.), 4.6.29, by Mrs. T. E. Hodgkin.	Where ringed, March, 1930, per <i>Country Gentleman</i> .
V.8545	Wilmslow (Ches.), 1.8.28, by by E. Cohen.	Near Manchester, 25.6.30, by H. Bolton.
T.4040	Near Gt. Budworth (Ches.), 22.8.28, young, by A. W. Boyd.	Where ringed, 20, 24.2.30, by ringer.
T.6049	Ditto nestling, 29.5.29.	Ditto 3.8.30.

No. *Place and Date Ringed.* *Place and Date Recovered.*

BLACKBIRD (*continued*).

T.5239	Church Stretton (Salop), 14.4.29, ad., by W. A. Cadman.	Where ringed 2.5.30, by ringer.
T.8921	Rugby (Warwick.), 12.6.29, nestling, by J. M. Hepburn.	Where ringed, 7.5.30, by F. A. Haigh.
S.2319	Malvern (Worcs.), 29.6.29, ad., by P. E. A. Morshead.	Where ringed, Aug., 1930, by H. G. Rogers.
V.9632	Ditto young, 25.5.28.	Where ringed, 6.7.30, by M. Sandys, per ringer.
S.2297	Ditto 7.6.29.	Where ringed, March, 1930, by ringer.
V.6825	Ditto ad., 18.12.27.	Ditto 29.5.30.
S.2352	Ditto 16.12.29.	Ditto ditto.
T.6956	Woodford Green (Essex), 15.6.29, ad., for Lond. N.H.S.	Ditto 23.3.30.
T.6978	Ditto 13.7.29.	Where ringed, 30.3.30, by M. Nicholls.
T.6959	Ditto 21.6.29.	Where ringed, 11.5.30, by J. Chetwood.
T.4760	Ditto 3.3.29.	Where ringed, 18.4.30, by ringer.
T.9405	Near Canterbury (Kent), 24.5.29, for St. Edmunds' School N.H.S.	Where ringed, 8.7.30, by W. Woollett.
T.5220	Polegate (Sussex), 6.1.29, by W. A. Cadman.	Where ringed, 24.5.30, by A. J. Hart.
T.4761	Addlestone (Surrey), 16.4.29, young, for Lond. N.H.S.	Where ringed, 24.3.30, by Mr. Minns.
S.2973	Harrow (Middx.), 20.6.29, young, by T. H. and W. R. Harrison.	Where ringed, 1.5.30, by Mr. Shuter.
T.6543	Taunton (Som.), 25.2.29, ad., by H. R. Mole.	Where ringed, 25 and 28.2.29 ; 3.3.29 ; 12.9.30, by ringer and S. G. Pyke.

REDBREAST (*Erithacus r. melophilus*).

D.4823	Carlisle (Cumbs.), 5.12.25, ad., by J. N. D. Smith.	Where ringed, 11.11.27 ; 10.2.30, by ringer.
H.5001	Malvern (Worcs.), 21.5.29, nestling, by P. E. A. Morshead.	Near where ringed, 23.6.30, by W. A. Cadman.
J.1072	Ditto young, 28.7.29.	Where ringed, 18.5.30, by ringer.
E.9536	Near Gt. Budworth (Ches.), 25.1.27, ad., by A. W. Boyd.	Ditto 19.1.30.
H.3686	Ditto young, 4.8.28.	Ditto, 15.12.28 ; 11, 30.1.30 ; 19.3.30.
H.6598	Ditto nestling, 11.7.29.	Near where ringed, 2.8.29 ; 26.10.29 ; 28.12.29 ; 8.1.30 ; 11.2.30.
H.7794	Hele (Devon.), April, 1929, by J. M. Hepburn.	Where ringed, 15.4.30, by ringer.

No.	Place and Date Ringed.	Place and Date Recovered.
HEDGE-SPARROW (<i>Prunella m. occidentalis</i>).		
F.2735	Near Perth, 27.2.29, ad., by Lord Scone.	Near where ringed, 25.9.30, by M. Martin.
D.3225	Near Gt. Budworth (Ches.), 6.10.25, ad., by A. W. Boyd.	Where ringed, 3 times Nov., 1925; 19.7.30, by ringer.
H.3718	Ditto 25.8.28.	Ditto, 29.9.28; 29.12.28; 6.2.30.
H.3805	Ditto 1.1.29.	Ditto, 5, 6.1.29; 5, 9.11.29; 7.3.30; 2, 26.4.30.
J.1091	Malvern (Worcs.), 27.10.29, ad., by P. E. A. Morshead.	Where ringed, 9.5.30, by ringer.
J.1089	Ditto 28.9.29.	Ditto 15.3.30.
H.6038	Battle (Sussex), 30.3.29, ad., by H. Whistler.	Ditto 16.4.30; 19.7.30.

SWALLOW (*Hirundo r. rustica*.)

TV.160	Dalston (Cumb.), 21.6.29, ad., by R. H. Brown.	Where ringed, 23.6.30, by ringer.
SZ.903	Ballaugh (I.O.M.), 22.7.29, nestling, by F. A. Craine.	Ballaclucas (I.O.M.), 1.6.30, by P. Ralfe.
S.3887	Ditto 9.7.29.	Uttoxeter (Staffs.) May, 1930, by W. McGoodwin.
TU.934	Near Gt. Budworth (Ches.), nestling, 27.6.29, by A. W. Boyd.	Near where ringed, 29.8.30, by ringer.
TV.236	Ditto 10.7.29.	Ditto, 21.8.30, by F. Taylor.
TU.894	Near Northwich (Ches.), 24.6.29, nestling, by A. W. Boyd.	Ditto, 30.7.30, by ringer.
TU.994	Ditto 4.7.29.	Ditto 24.7.30.
TX.969	Laugharne (Carms.), 13.8.29, ad., by J. F. Thomas.	Where ringed, 13.8.30, by ringer.
TY.26	Ditto 22.8.29.	Ditto 11.8.30.
SV.641	Ditto 6.8.27.	Ditto 2.8.29; 1.8.30.
SV.737	Ditto 23.8.27.	Ditto, 27.8.28; 7.8.29; 13.8.30.
TU.962	Pangbourne (Berks.), 2.7.29, young, by C. W. Swiny.	Ditto, May, 1930, by M. Edwards.

MARTIN (*Delichon u. urbica*).

SU784	Glen Esk (Forfar.), 13.7.27, young, by H. G. Watson.	Near Brechin (Forfar.), 2.8.30, by W. Stormonth.
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SAND-MARTIN (*Riparia r. riparia*).

K.3918	Kirkby Lonsdale (Westmorland), July, 1930, young, by H. J. Moon.	Aiguillon-s-Mer (Vendée), France, 3.9.30, by Prof. G. Guérin.
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SWIFT (*Apus a. apus*).

C.6284	Near Leamington (Warw.), 13.7.25, ad., by P. K. Chance.	Where ringed, 12.7.30, by ringer.
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No. *Place and Date Ringed.* *Place and Date Recovered.*

SWIFT (*continued*).

H.2436	Near Leamington (Warw.), 16.7.28. ad., by P. K. Chance.	Where ringed, July, 1930, by ringer.
F.4005	Ditto, 2.7.27, ad., by J. M. and P. K. Chance.	Ditto 12.7.30.
F.4008	Ditto	ditto ditto.
F.4012	Ditto	ditto Warnford (Hants.), Aug., 1930, by J. Sibley.
6207	Near Reading (Berks.), 24.5.22, ad., by N. H. Joy.	Where ringed, 24.7.30, by E. Stanley.
TW.509	Ramsbury (Wilts.), 29.6.29, ad., by N. T. Walford.	Where ringed, 21.6.30, by ringer.

WRYNECK (*Jynx t. torquilla*).

J.5110	Eton (Bucks.), 7.8.29, nest- ling, by A. Mayall.	Pangbourne (Berks.), 19.6.30, by C. Turner.
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CUCKOO (*Cuculus c. canorus*).

Z.7928	Eton (Bucks.), 23.6.28, nestling, by A. Mayall.	Lembé, Eboko, French Kamerun, W. Africa, 30.1.30, by Administrator,
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LITTLE OWL (*Athene a. vidalii*).

RR.6605	Near Canterbury (Kent), 6.6.28, ad., for St. Ed- mund's School N.H.S.	Near Canterbury, 18.4.30, by J. R. Brook.
RR.1425	Ditto young, 2.6.27.	Elham (Kent), 3.7.30, by J. L. Rowlinson.

TAWNY OWL (*Strix a. sylvatica*).

28825	Weybourne (Norfolk), 10.5.28, young, by A. P. Meiklejohn.	Kelling (Norfolk), June, 1930, by R. M. Garnett.
20243	Uffculme (Devon.), 8.5.22, young, by B. Clarke.	Where ringed, 23.9.30, by J. W. Clarke.

KESTREL (*Falco t. tinnunculus*).

73762	Hickling (Norfolk), 8.6.27, nestling, by A. W. Boyd.	Near Norwich, May, 1930, by W. R. Hewitt.
79087	Little Eversden (Cambs.), 7.6.27, young, by G. W. Thompson.	St. Neots (Hunts.), 26.6.30, by E. Chance.
RR.1478	Canterbury (Kent) 23.6.29, young, for St. Edmund's School N.H.S.	Horsham (Sussex), 19.5.30, by E. F. St. John.
RR.7309	Near Hastings (Sussex), 27.6.29, nestling, by E. F. Wood and B. T. Brookes.	Near Brighton, April, 1930, by A. G. Levett.

MONTAGU'S HARRIER (*Circus pygargus*).

RS.2673	Hickling (Norfolk), 24.6.30, young, by S. Wilson.	Lagarde (Cantal), France, 21.9.30, by E. Barthélemy.
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No.	Place and Date Ringed.	Place and Date Recovered.
SPARROW-HAWK (<i>Accipiter n. nisus</i>).		
RR.1926	Curthwaite (Cumb.), 26.6.29, nestling, by R. H. Brown.	Near Dalston (Cumb.), 4.6.30, by ringer.

HERON (*Ardea c. cinerea*).

103295	Almondbank (Perths.), 22.5.30, nestling, by Lord Scone.	Inishmore (Galway), 19.8.30, by J. Morris.
105940	Crofton (Cumb.), 1.5.29, nestling, by R. H. Brown.	Arrochar (Dumbartons.), April, 1930, by L. J. Rintoul.
105926	Floriston (Cumb.), 5.5.28, nestling, by R. H. Brown.	Near Dalston (Cumb.), March, 1930, by ringer.
106595	Uldale (Cumb.), 7.6.29, nest- ling, by R. H. Brown.	Cockermouth (Cumb.), April, 1930, by J. Bacon.
100868	Faringdon (Berks.), 12.5.29, by C. J. D'Aeth.	Kirtlington (Oxon.), 25.4.30, by E. King.
105884	Fawley, Henley (Bucks.), 10.5.30, young, for Lt.-Col. Pollitt.	Near Spalding (Lines.), early Nov., 1930, by J. W. Clarkson.

SHIELD-DUCK (*Tadorna tadorna*).

AD.630	Tentsmuir (Fife), 25.4.30, ad., by Lord Scone.	Near Scharhörn Is., R. Elbe, Germany, 5.9.30, by A. Fesubert.
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MALLARD (*Anas p. platyrhynchos*).

26982	Leswalt (Wigtown.), 18.1.29, ad., by M. Portal.	Pant-Glas (Caernarvon.), 2.10.30, by C. Wauchope.
AF.142	Hickling (Norfolk), 8.3.30, ad., by A. W. Boyd.	Where ringed, 27.9.30, by J. Vincent.
AF.229	Ditto	ditto. Ditto 15.9.30.
AF.146	Ditto	ditto. Ditto 15.9.30.
AF.185	Ditto	ditto. Ditto 15.7.30.
AF.219	Ditto	ditto. Ditto 19.4.30.
AF.106	Ditto	ditto. Ditto 24.9.30.
AF.215	Ditto	ditto. Ranworth (Norfolk), 13.8.30, by H. J. Cator.
AF.236	Ditto	ditto. Thisted Fiord, Mors Is. (Jylland), Denmark, 5.10.30, by C. C. Andersen.
AF.153	Ditto	ditto. Near Norrköping, Sweden, 8.8.30, by H. Aschan.
AF.206	Ditto	ditto. Lake Hjelmar, Central Sweden, 2.9.30, by J. C. Montgomery.
AF.143	Ditto	ditto. Near Emden, E. Friesland, Germany, 7.8.30, by R. Dross.
AF.232	Ditto	ditto. Plauer See, S.E. Mecklen- burg, Germany, 15.7.30, by J. Aussen.

No.	Place and Date Ringed.	Place and Date Recovered.
TEAL (<i>Anas c. crecca</i>).		
79109	Leswalt (Wigtown.), 18.1.29, ad., by M. Portal.	Near where ringed, 8.9.30, by ringer.
79112	Ditto 10.2.28.	Boat-of-Garten (Inverness.), 31.8.30, by Sir S. Maryon- Wilson, Bt.
76180	Longtown (Cumb.), 3.3.25, by Sir R. Graham, Bt.	Near Norden, E. Friesland, Germany, 11.9.30, by Kulik and W. A. Friedlein.
WIGEON (<i>Anas penelope</i>).		
RR.8669	Loch Leven (Kinross), 12.6.30, young, by Lord Scone.	Brière (Loire Inférieure), France, 25.10.30, by O. Lucien.
CORMORANT (<i>Phalacrocorax c. carbo</i>).		
104113	Badcall Bay (Suth.), 4.7.30, nestling, by E. Cohen.	Near Loch Kinder (Kirk- cudbright.), 23.9.30, by D. Purdie.
102313	Mochrum (Wigtown.), 25.6.29, young, by Lord D. Crichton-Stuart.	Near Pontevedra (Galicia), Spain, Jan., 1930, by El Vizconde de la Armeria.
107522	Dulas Is. (Anglesey), 22.6.30, young, for Lt.-Col. Pollitt.	Poole (Dorset), 28.9.30, by H. Hale.
106399	Ditto 22.6.30.	River Dart (Devon.), 5.9.30, by M. Adams.
107524	Ditto 22.6.30.	Ditto 2.9.30.
106376	Ditto 11.7.29.	Torpoint (Cornwall), 15.3.30, by C. S. Nethercott.
106305	Ditto 22.6.30.	Glénans Is., N.W. France, 9.9.30, by H. B. M. Consul, Brest.
103419	Rhossilli (Glam.), 14.6.30, by F. J. L. Mitchell.	Staines Reservoir (Middx.), 23.8.30, by W. E. Glegg.
SHAG (<i>Phalacrocorax a. aristotelis</i>).		
104267	Badcall Is. (Suth.), 17.6.26, nestling, by E. C. Sharp.	Thurso (Caithness.), 3.7.30, by A. McLean.
104488	Harris (Out. Heb.), 2.7.29, nestling, by E. C. Sharp.	Lochmaddy (N. Uist), 1.10.30, by M. Munro.
104120	Badcall Bay (Suth.), 4.7.30, young, by E. Cohen.	Between Raasay and S. Rona, Sept., 1930, by H. Cumming.
104115	Ditto 4.7.30.	Yatersay Is. (O. Hebrides), end Oct., 1930, by D. McNeil.
104676	Edrachillis Bay (Suth.), 6.7.27, nestling, by W. and A. B. Duncan.	Lairg (Suth.), July, 1930, by A. MacKenzie.
105121	Peel Hill (I.O.M.), 7.7.29, young, by R. Howarth.	Douglas (I.O.M.), 19.12.29, by Col. H. W. Madoc.
GANNET (<i>Sula bassana</i>).		
103861	Ailsa Craig, 29.7.24, young, by D. Macdonald.	Eriskay (O. Hebrides), Sept., 1930, by A. W. Macphie.

(To be continued.)

NOTES

CROSSBILLS EATING CRAB-APPLES.

SINCE October (1930) Crossbills (*Loxia c. curvirostra*) have been conspicuous in Rocklow, co. Tipperary, and have divided their days between the fir-cones and crab-apples.

I have been interested in watching them on the crab-apple trees. They stand above an apple, shred off about half the top, exposing in an incredibly short time the pips, which they then swallow voraciously. It is undoubtedly the pips they are seeking, although they also occasionally eat some of the apple shreds before the pips are uncovered.

These particular Crossbills are winter immigrants, as were a flock which remained here part of last year, but in the Galtee mountains a colony or two have bred uninterruptedly for at least twenty-one years (see *Irish Nat.*, 1916, p. 69, and *Brit. B.*, Vol. X., p. 122).

C. J. CARROLL.

RAPID REPLACEMENT OF NEST BY PIED WAGTAIL.

MRS. MICHOLL'S letter (*antea* p. 126) reminds me that on June 13th, 1930, the nest of a second brood of Pied Wagtails (*Motacilla a. yarrellii*) on an outbuilding of my home in Denbighshire contained three eggs and one of the Cuckoo (*Cuculus c. canorus*) which were all taken on that day. On July 19th a noisy young fledgling Cuckoo was seen by one of my family being fed by Wagtails on the roof of an outbuilding, and two or three days later I saw it myself on the lawn. This gives a period of thirty-six days between the taking of the Wagtail's nest and the first appearance of the fledged Cuckoo. Allowing ten days for the Wagtails to re-build and re-lay, the incubation- and fledging-periods of the young Cuckoo combined only amount to twenty-six days—a very short period as compared with that of thirty-two to thirty-three days given in the *Practical Handbook*. I am quite certain that there was only one pair of Pied Wagtails about the place.

W. M. CONGREVE.

The replacement period given by Major Congreve is certainly remarkably short, but it must be remembered that the Wagtails had already laid two clutches and there is the possibility that the third laying was a short set and the replacement period some days under the normal ten days. Young Cuckoos may leave the nest before they are completely

fledged and have acquired full power of flight and the bird seen on the 19th may also have strayed a few yards from the nest.—F.C.R.J.]

TREE-CREEPER REMOVING ITS DESERTED EGGS AND LAYING AGAIN.

A TREE-CREEPER (*Certhia f. britannicus*) in my wood near King's Lynn this year laid five eggs in a bark lean-to. For some reason it deserted and laid five more eggs behind another piece of bark about fifty yards away. These eggs were nearly ready to hatch when the bark was torn down by a squirrel and the eggs broken. Two days after this happened I looked in the original nest and the five deserted eggs were still there; the next day they were gone, and the day after there was a fresh egg in the nest. Eventually the bird laid four more eggs, all of which were hatched off safely.

N. TRACY.

DISPOSAL OF ADDLED EGGS AND DEAD NESTLINGS BY GREAT AND BLUE TITS.

WITH reference to notes on the above subject (Vol. XXIII., pp. 94, 95 and 128), I was able to make further observations from my nesting boxes this year (1930).

On April 27th a Great Tit (*Parus m. newtoni*) laid the last egg of an unusually small clutch of four. Incubation, however, was commenced on April 26th. On May 10th three eggs were hatched. On May 11th the nest contained only the three nestlings. On May 29th the three young birds were fledged, and I dismantled the nest, finding it to contain nothing. Evidently the egg (or possibly later-hatched nestling) was ejected late on May 10th or early on the 11th.

On May 9th a Blue Tit (*Parus c. obscurus*) laid her ninth and last egg. On May 22nd and 23rd all the eggs were hatched. On June 1st the nest contained four nestlings only and on June 11th they were fledged. On removing the nest I found three dead nestlings (apparently about eight days' old at death) buried on the floor of the box below all the materials. Two other nestlings must also have died, but these must have been ejected.

B. H. RYVES.

BLACK REDSTART BREEDING IN KENT.

ON April 22nd, 1930, I noticed a Black Redstart (*Phœnicurus o. gibraltariensis*) in a hedge near a farm in Kent, and the next day I found a pair amongst the farm-buildings. I

watched the birds for more than a week, and knowing the Common Redstart was able to identify them satisfactorily. Briefly, the cock showed chestnut only in the rump and tail, had a conspicuous white wing-patch and sooty black breast.

As I had to leave the neighbourhood, I told a friend about the birds and he visited them occasionally. I was surprised to hear from him that they had made a nest in the farm-buildings, three or four young being hatched by June 10th.

The birds built a second nest and laid eggs about July 7th and young were hatched on July 23rd, but only two of these survived. One, which fell out of the nest when partially feathered, was found dead by my friend, who put it in spirit.

Later on, revisiting the place, I saw the two nests, one being in an outhouse and some eight feet from the ground, while the other was on a rafter about 15 feet from the ground in a barn. I was also able to watch the parent birds with five full-grown young. They were still about the farm-buildings up to the middle of September.

I have already briefly recorded the breeding of these birds in *The Field* (25. x. 1930, p. 591), but the rarity of the event seems to justify a fuller account. T. J. WALLACE.

[Mr. Wallace is to be sincerely congratulated on having made such an interesting discovery. It will be remembered that Mr. T. A. Coward recorded the nesting of a pair in a cliff on the south coast in 1923 and 1924 (*antea*, Vol. XVIII., pp. 76-7) and again of two pairs in the same place in 1925 (*Birds of the Brit. Is.*, third series, p. 132). Since this date Mr. Coward has no further news of these birds. He allows me to state that the locality is different to those found by Mr. Wallace. The Black Redstart is thus for some reason evidently seeking to establish itself in the south of England, and it is to be hoped that the conditions it meets will be favourable to its increase. Ornithologists will, we feel sure, do everything possible to assist the establishment of so interesting a bird, and its progress will be watched with great interest.

The nestling, which Mr. Wallace's friend was so thoughtful as to preserve, has been sent to me and is just sufficiently feathered to enable me to identify it with certainty as a Black Redstart.—H.F.W.]

BLACK REDSTART INLAND IN HAMPSHIRE.

THE occurrence of a Black Redstart (*Phaniscus o. gibraltariensis*) on the high ground north of Winchester may be of

sufficient interest to record. The bird which I have had the opportunity of watching several times since November 7th, 1930, is slate or mouse-grey in colour with a flame-red tail, very distinctive in flight. The first time I saw the bird it had made its way into an outhouse and was dashing itself against the window. I had thus an excellent view of it at close quarters and was able to identify it at once.

B. H. G. WORMALD.

NIGHTINGALE ON MIGRATION IN NORFOLK.

As the *Practical Handbook* states that there is very little information as to the autumn movements of the Nightingale (*Luscinia m. megarhyncha*) it may be of interest to record that on September 28th, 1930, I found one in my conservatory at Sheringham. It was in good condition and in excellent plumage.

The bird was liberated and not seen again. No others were seen.

E. G. HERBERT.

ALPINE SWIFT IN ESSEX.

ON August 17th, 1930, at Dovercourt, Essex, I noticed, among a small flock of Swifts, one bird of a totally different type. This was much larger than the Common Swifts; its upper-parts were a deep brown instead of black; its throat was a noticeable greyish-white, and its belly was a pure white from the breast almost down to the under tail-coverts (so it appeared to me).

The habits of this bird seemed to be very similar to those of the Common Swift, and it remained with these birds until about the 19th or 20th, when all of them disappeared.

I should much like to know whether I am right in thinking this bird was an Alpine Swift (*Apus melba*).

HAROLD E. W. BRAUND.

[We think Mr. Braund's description could not apply to any other bird than the Alpine Swift.—EDS.]

OSPREYS IN GREAT BRITAIN.

IN ROSS-SHIRE.

ON June 21st, 1930, I was walking towards a river at the end of a loch in south-west Ross-shire when I saw a large bird rise out of the river bed carrying a big fish head foremost in its talons, and take it up to a ledge of rock where it proceeded to eat it. I was some way off and there was a thick drizzle of rain, but I could see the bird's brown back and white under-parts; something then disturbed it and it flew off with the fish and disappeared behind some rocks. It was no doubt an Osprey.

M. BARCLAY.

[Although it cannot have been connected with the September immigration, the occurrence of this bird should be recorded.—EDS.]

IN SUFFOLK.

ON the morning of September 15th, 1930, I saw an Osprey flying over a marsh between the river Alde and the sea in Suffolk. It settled on a telephone post and I watched it through my binoculars at a distance of about 150 yards. It was in good plumage and apparently an adult.

Later in the day I again saw it carrying a fish and pursued by a mob of birds.

I last saw the bird on the following day at rest on a post in the bed of the river Alde. J. B. WATSON.

IN LEICESTERSHIRE.

EARLY in October, 1930, an Osprey was seen fishing in the lake at Belvoir, Leicestershire. A keeper unfortunately shot at and wounded it, not knowing what sort of bird it was. He managed to catch it, and it is now in captivity at Belvoir Castle. F. K. STAUNTON.

IN HERTFORDSHIRE.

LORD DESBOROUGH informs me that his keeper, H. S. Hayward, observed an Osprey in Panshanger Park from September 17th, 1930, to November 2nd; while on November 4th the bird was seen some two miles away near Tewin Water, but has not been seen since. The keeper informs me that he watched the Osprey catch a fish in the river Mimram in Panshanger Park and that he saw the bird regularly two or three times a week about the river between the dates given above. H. F. WITHERBY.

HABITS OF AN OSPREY IN NORFOLK.

As I had the good fortune to watch an Osprey (*Pandion haliaetus*) this year (1930) from October 12th to 22nd at Gunton Great Water, Norfolk, a few notes on what I was able to observe may be of interest.

My first view of the bird was on October 12th as it flew across the water and settled on a dead branch of a fir tree—I watched it with my glasses sitting there for an hour, occasionally preening itself—an adult in splendid plumage, very white on cheeks and underneath. It then flew down, hovering Kestrel-like over the water and plunged feet downwards, sending the spray flying all round, but alas it got no

fish, only black mud. Three times it plunged with no success, then flew close to where I was crouching behind a bush and lit on the bare bough of an elm tree. I had a close view of it for twenty minutes. It then flew over the water again, hovered and plunged three times again with no better success. It has a wonderful gliding flight as it quarters the water, first hovering a second before it strikes.



The Osprey at Gunton Great Water.
(*Sketched by Mrs. Barclay.*)

On the next day when I arrived the Osprey was sitting on a dead bough of a tree on the island (it usually started fishing from there) and presently it sailed round the pond, looking down all the time, hovered and plunged, nearly becoming immersed, and brought up a bream weighing quite two pounds. Uttering a cry like "Chee Chee" it carried the fish to a dead fir branch and started to devour it. First it slit up the underneath of the fish and then pulled out the backbone, which it dropped, then took the head off and dropped this, eating all the rest.

On subsequent days I frequently saw the Osprey catch fish, but I was never near enough to see again exactly how it ate the fish. These appeared to be all bream, some of a pound to a pound and a half, others smaller. The bird usually fished between eleven and twelve in the morning and again between two and three in the afternoon. Once I saw it plunge suddenly without warning, but usually it hovered almost like a Kestrel and then just before plunging dropped its legs straight down, going into the water with a tremendous splash.

Its method of carrying the prey varied. As a rule it carried the fish head foremost, held fast by both talons, but once in catching a small fish I saw the Osprey leave go with one foot (which it drew up) and hold the fish dangling with the other.

I only heard two call-notes, the one already mentioned and another which sounded to me like "Killy Killy Killy," repeated very quickly. This was made when the bird was flying across the water to its favourite dead tree on the island.

On one occasion the Osprey was flying round amongst swarms of Wood-Pigeons and Rooks. Birds did not actually mob it, but they were very curious and conscious of its presence. Numerous Mallard on the pond seemed to pay little heed to it.

M. BARCLAY.

AMERICAN BLUE-WINGED TEAL IN IRELAND.

AN American Blue-winged Teal (*Anas discors*) has recently been acquired by the National Museum of Ireland.

This bird, a male, was obtained on the Wexford slob on August 16th, 1930, and was recorded by W. J. Williams as a Garganey in eclipse in the *Irish Naturalists' Journal* for September.

Mr. Williams agrees with my determination of the specimen and there is a correction of the record in the *Irish Naturalists' Journal* published in November.

So far as I am aware this is the second Irish and fifth British record for the species; the original Irish example is also in the National Museum and is an immature female shot at Ballycotton, co. Cork, in September, 1910.

EUGENE O'MAHONY.

FULMAR NESTING ON THE GREAT SALTEE.

IN May, 1929, a party of naturalist-photographers spent some days on the Great Saltee Island, co. Wexford, where, among

other birds, a single Fulmar (*Fulmarus g. glacialis*) was seen (*Irish Nat. Journ.*, II., p. 235). In 1930 the party again visited the island, and I was fortunate in being a member of it. On May 12th Mr. G. Hodge, one of the two who had seen the Fulmar in 1929, was climbing on the great granite cliff at the south-west end of the island in search of subjects to photograph. Peering above a ledge as he ascended he was saluted by the vomited oil of a Fulmar, which rose from its egg and flew off. Later in the day he took me to the place, and although our search of as much of the cliff as was accessible did not reveal any more nests, it is likely enough that there were others, for at one time we saw four Fulmars sailing about the cliff-face.

Bearing in mind the recent history of the Fulmar, it may be that, having colonized the Saltees, it will next invade the cliffs of the Pembrokeshire coast and islands, which are at no great distance and are admirably suited to its purpose; and in this connexion it may be worth while to say that from the lighthouse on Strumble Head I watched a Fulmar careering over the sea in the early morning on May 6th.

CHAS. OLDHAM.

LATE STAY OF CURLEW ON WELSH BREEDING- GROUNDS.

A DENBIGHSHIRE Grouse moor gamekeeper friend of mine, who has numbers of Curlew (*Numenius arquata*) breeding on his moor every spring, has written me as follows, under date October 26th:—

“One thing I might report to you is the Curlew, we have a good few yet on the moor. It is more like April or May, the noise they make in the evening. Always before there was seldom one left on the 12th August.”

I can confirm that one rarely sees Curlew on the north Wales moors on August 12th, though I have known of an occasional juvenile being shot on, or about, that date in years gone by.

W. M. CONGREVE.

SANDWICH TERN IN CORNWALL IN NOVEMBER.

At low water on the morning of November 5th, 1930, among half-a-dozen Kittiwakes that were standing on the shore in Whitesand Bay, waiting for an opportunity to filch the sand-launces with which the fishermen were baiting their bass-lines, was one adult Sandwich Tern (*Sterna s. sandvicensis*) in winter plumage.

CHAS. OLDHAM.

BLACK GUILLEMOT IN CORNWALL.

THE Black Guillemot (*Uria g. grylle*) is hardly known in Cornwall, and it may be well to record that on the morning of November 7th and again next day a bird of the year, in the freckled plumage of winter and with reddish-brown feet, was diving for food just outside the surf in Sennen Cove. In the act of submerging the wings were half opened—not so widely as a Common Guillemot's—and the tail-feathers spread. On several occasions when it came up again the bird was mumbling between its mandibles something that I took to be a small crab.

CHAS. OLDHAM.

SAFETY DEVICES IN WINGS OF BIRDS—*Correction*.—Mr. Graham informs us that by a clerical error the span loading of the Blackbird was unfortunately wrongly given in the table at the end of his paper on this subject (*antea*, p. 64). This should read 2.45 oz. per foot instead of 5.6 as given.

TEMMINCK'S STINT IN KENT.—Mr. N. F. Richardson records (*Field*, II. x. 30, p. 520) that a bird shot on the marshes near Whitstable on September 23rd, 1930, and brought to him for identification, was a specimen of *Calidris temminckii*.

LITTLE GULL IN FIFESHIRE.—Mr. C. R. Stonor informs us that he saw a *Larus minutus* on November 1st, 1930, at St. Andrews. The bird was immature and its small size compared with Black-headed Gulls, as well as its dark wings, were particularly noticeable.

GUILLEMOTS IN INNER LONDON.—Mr. P. H. Trahair Hartley informs us that he saw two Guillemots (*Uria aalge*) on November 7th, 1930, on the river just above London Bridge. Judging by their dark throats, Mr. Hartley considered them to be still in summer plumage.

LETTER.

" REED-BUNTING SHELTERING YOUNG FROM SUN."

To the Editors of BRITISH BIRDS.

SIRS,—With reference to Mr. J. H. Owen's interesting note on this subject (*antea*, pp. 157-9), I venture to suggest that the action depicted was not intended to shelter the young but was merely the position of wings extended and back feather-tracts separated, which is habitually adopted by most birds when feeling too hot in the sun.

The bird in the picture was evidently feeling the heat, as evidenced by the open bill, and although he happened to be shielding the young

from the sun in the lower picture, he could not have been doing so in the upper, when he was standing at right angles to his first position.

A very similar but exaggerated position, with outspread and lowered wings and tail, is assumed by birds of prey when in possession of food, in order to screen it from observation. B. B. OSMASTON.

REVIEWS.

A Bird Watcher's Note Book. By J. W. Seigne. Illustrated. (Philip Allan.) 12s. 6d. net.

A CONSIDERABLE part of this book is devoted to Woodcock and Snipe, which the author has made a special point of studying on his own property and elsewhere in Ireland. Although Major Seigne often treats his subjects in a somewhat superficial way, many of his first-hand observations on these and other birds are well worth the attention of ornithologists, while a chapter on "Vermin and the Sportsman" by Major Maurice Portal will be of interest to game preservers as well as naturalists.

In discussing the movements of Woodcock and Snipe and their apparent disappearance from breeding quarters during August and September, Major Seigne gives some evidence to show that these birds may be scattered locally at this time in unusual haunts. A number of results of ringing Woodcock are discussed, but the author does not appear to have seen Dr. Landsborough Thomson's very full paper on this subject (*Brit. Birds*, Vol. XXIII.). Major Seigne considers from observation of nesting birds that the Irish breeding Woodcock is of a richer chestnut with more distinct mottling than the migrant, which is grey with less distinct mottlings. Extremes of these two types are well figured by Mr. P. Rickman in a coloured frontispiece.

In this connexion I might mention that I have two specimens which had been ringed as nestlings in Ireland and both these are distinctly of a grey type. But further enquiry into this point is worth while, as most skins in collections are winter birds which may have been migrants.

On page 20 the author states that in 1928 there were "literally thousands of Woodcock drowned off the Lowestoft-Yarmouth area. . . . One fishing-boat alone picked up 470 and sent them to the London markets." We have seen this statement before in various forms, but have been unable to verify it and we hope that Major Seigne will give us the proof.

As a result of much watching of Snipe when "drumming" the author appears to think that part of the sound is due to the rapid quivering of the wing-tips in the downward dive.

On page 100 the author states that he hears from a friend in Kerry that he found both the Hen-Harrier and Montagu's Harrier nesting this spring, a statement which has little value since no evidence is given to confirm it. We believe that Montagu's Harrier has not yet been proved to breed in Ireland, though it has been suspected of doing so. Another loose statement is that the Buzzard is "almost extinct". Does this mean that it still breeds in Ireland and if so will the author produce the evidence. Again, we read that Short-eared Owls "seem to be becoming increasingly common as a breeding-species on many

moors in Ireland"—an astounding statement to make without giving a shred of evidence, since there is so far as we are aware no proof that the bird has ever bred in Ireland.

Major Seigne writes pleasantly and his book is well worth reading, but we have quoted enough to show that many of his statements require verification.

H. F. W.

Dream Island. A Record of the Simple Life. By R. M. Lockley. Illustrated. (Witherby.) 8s. 6d. net.

FEW people are lucky enough to realize their boyhood's dream; Mr. Lockley is a fortunate exception. This book, in which he tells the tale, is full of thrills, both for the sailor and for the bird-lover. It is a straightforward story of adventure and hard work. For the sometimes kind, and sometimes cruel sea, the writer has a great love. The account of how he rebuilt his ruined house, and the strenuous life he lives amongst his lobster pots, rabbits, goats and sheep on Skokholm is absorbing. His love of birds runs through the book like the recurring phrase in a Thrush's song. No one else has studied in such detail the habits of the Manx Shearwater, many thousands of which nest on "Dream" Island. The illustrations by Mrs. Lockley are full of spirit; and again, Mr. Lockley is lucky in finding a wife who enjoys the hardships and perils of the Island life.

E. L. TURNER.

Rambles in Britain's Birdland. By Oliver G. Pike. (Jenkins.) Illustrated. 7s. 6d. net.

IN this book Mr. Pike gives interesting accounts of his observations in widely separated parts of the British Islands. First place and the longest chapter is devoted to his share as photographer in Mr. E. Chance's notable studies of the Cuckoo. Mr. Pike pays special attention to what he saw and photographed at the various times he was at close quarters with the Cuckoo during egg deposition, and his accounts and action-photographs are very interesting, but we think it is a pity that he and others should be dogmatic on the invariability of a habit of the Cuckoo or any other bird. The more intensively are birds studied the more certain does it appear that habits are not invariable. Moreover, to be dogmatic is to be unscientific.

Further interesting chapters, all of them illustrated, are on the Black-necked Grebes in Hertfordshire, of which it will be remembered Mr. Pike secured a wonderful series of photographs (see *Brit. B.*, Vol. XIII.), Fulmars at St. Kilda, Buzzards and Ravens in Wales, Divers in Scotland, and the Kentish Plover. In a chapter on birds of prey the author mentions two cases he has known of two hen Sparrow-hawks raising the same nest. In one of these cases Mr. Pike states that one of the hens having killed the other and eaten part of the corpse, eventually hatched the joint clutch of eggs and reared the large family. In the other case there were eight eggs in the nest and a keeper trapped both females.

Mr. Pike's book contains a number of interesting observations, though we may criticize as misleading some of his assertions given as proved facts, which seem to us mere assumptions, as, for instance, that a Cuckoo when it reaches maturity will lay in the nest of the species in which it was reared and that Buzzards mate for life.

The photographs are excellent, but we think the superimposing of other photographs on the main one in the plates has been overdone,

and often spoils the picture unnecessarily, though in some cases this plan has its advantages. H.F.W.

Selvaggina e Caccie in Italia. (Report by Drs. G. Bonelli and E. Moltoni.) 4to. pp. xiv., 182. Milano, 1929.

IN the autumn of 1927 a Committee was formed to enquire into the present condition of game and bird-life generally in Italy, thus continuing the work inaugurated by the late Prof. Giglioli. A questionnaire was issued to every province and the present report contains the gist of the returns, which naturally vary considerably in value. Space will not permit us to deal fully with these reports, but we note that the lists of diminishing species are usually much longer than those which show an increase. The Quail is noted as decreasing in most of them, while the Red-legged and Grey Partridges and the House-Martin also figure prominently in the same lists. We should like to draw special attention to the returns for twenty-nine years past for two bird-catching properties in Savona, worked not simultaneously but consecutively. The lowest return for any one year (1918) was 1,348, and the highest was in 1927, when 4,004 birds were taken, nearly all during the autumn migration. In Calabria, Dr. Alessio reports that about 2,000 Starlings were brought into the town of Molochio daily between October 20th and March 20th.

The Report is a straightforward statement of facts and it is at least satisfactory to note that several reports strongly urge alterations in the game laws with a view to the protection of those species which breed in the country.

F. C. R. JOURDAIN.

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NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U.

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FURTHER NOTES ON THE BREEDING-HABITS OF THE MANX SHEARWATER.

BY

R. M. LOCKLEY.

THESE notes on the Manx Shearwater (*Puffinus p. puffinus*), taken in 1930, should be added to my first paper on the subject which appeared in *British Birds*, Vol. XXIII., pp. 202-218. Unfortunately my time this year was so occupied that I had no leisure for more than casual observation.

TABLE OF ARRIVAL AND DEPARTURE.

Year.	First bird arrived.	Plentiful by	Last young bird seen alive on land.
1927	—	—	October 14th
1928	February 9th	February 26th	„ 16th
1929	„ 2nd	„ 28th	„ 12th
1930	„ 13th	„ 26th	„ 15th

ARRIVAL FLIGHT.

The majority of adults, as in the past two years, arrived from a south-easterly direction, flying north-westwards through the Broad Sound between Skomer and Skokholm, but many passed on the outer or south side of the latter island, reuniting with the main body westwards of the two islands. Comparatively few birds seem to arrive from the westward, and on several favourable occasions when I was sailing home from Grassholm I observed only single birds at wide intervals flying eastwards thus. The same may perhaps be said of the northward, only scattered birds converging upon Skomer from St. Bride's Bay, as far as I have observed on the few favourable occasions when I have been in that neighbourhood.

I was puzzled to know exactly where the main flock mustered before dark, when, on misty days, they arrived before sunset. From careful watching I am now able to say that they spread themselves in large flocks along a line roughly drawn from a point nearly one mile W.S.W. from Skokholm Head to a point about one mile N.W. of Skomer Head. Here they fly to and fro over the water, the flocks mingling and separating indiscriminately, now flying one way, now wheeling and circling back upon other flocks. Especially in calm weather, they may rest for long periods

on the water, washing, preening, drinking, and diving for food. The arrival of a fresh flock is then often the signal for a general rising, and it is most striking to witness the stretching of hundreds of long black wings simultaneously in flight.

On rough days when the wind lies somewhere between S. and W. it is frequently possible to see the flocks from the cliffs of the W. side of Skokholm, for on those evenings the birds approach to within a few score yards of the shore and carry out their graceful manœuvres and gyrations. They are certainly at their best in such weather.

Having occasion to burn a few acres of old half-dead heather on March 30th, I planned to have it well alight in time to witness the landing of the Shearwaters, and was repaid by what must have been a unique and very beautiful sight. There was a strong south wind blowing which kept the flames very bright and carried the smoke away swiftly and low. The first birds arrived just before 8 p.m., flying in from the north coast, head to wind. Half an hour later there were hundreds in the air, their white breasts flashing as they caught the firelight. The strong wind enabled them to advance very slowly, with wings fluttering or quivering after the manner of a hovering Kestrel. Many in the area of firelight did not pass by at once but, time after time, after slowly advancing with trembling wings, would retreat with the wind again without changing their head-to-wind position or perceptibly altering the motion of their wings; in short, they appeared to be flying "backwards" at one level as easily as they advanced. Other birds would fly fairly close to the flames or the burnt ground and then shoot upwards perpendicularly with great speed until their white breasts barely showed in the sky. They flew at a height above the ground varying from ten feet to as far as eye (say 100 feet up) could see. On calm nights I have observed they proceed, as a rule, by a series of rapid side-to-side glides, but on this night they only glided when falling away to one side, and also they would glide forward shakily with wings much curved just before they dropped to earth.

Many landed at the mouths of their holes, but some on the grass away from holes, and I was rather surprised to see a few of them walking about quite freely, though with frequent pauses, on bent tarsi, with that springy movement which such a walking position gives to the body. When approached they made short little runs upright on their toes, as described in my first paper. It is now clear to me that the adult

Shearwater, when not alarmed and confused, can travel fairly well on land and is able to carry out the business of courtship, home-hunting, nest-building, and not improbably of coition (though I have no evidence of this last) with less awkwardness than is generally imagined. I observed that when encountering irregularities of ground or surmounting the tumble-down hedges they fluttered their wings very slightly in the strong wind and this helped them over easily and without that struggling with feet, wings and beak which generally occurs on calm nights.

CALL-NOTE.

It was most noticeable that very few birds of the vast number flying above the burning heather were calling, yet the cries were as numerous as usual. More noise was made by those birds which had been (and still were as yet) underground all day.

In my first paper the accent on the call-note was omitted by error. I would amend it as below :—

kūk-kūk-kūk-ōō.

When handled, the adults as well as the fledged young scream this same note in their alarm.

COURTSHIP AND NEST-BUILDING.

At present I am not able to give any further details of courtship and this, as well as the meaning of their many nocturnal activities outside and in the burrow, still needs investigating. I have good reasons for conjecturing that there are some quite elaborate and prolonged ceremonies in connexion with nest-making. I found that the usual lining of dead grass, bracken, etc., was already added to the scrape in the recess in every hole I examined on April 3rd, a month before general laying begins. In several burrows running where bluebell and vernal squill flourished, I found the bulbs of these plants lining the nests most decoratively. These bulbs had, of course, been torn from the walls of the burrows, indicating a further nocturnal activity of the nesting adults.

MARKED NESTS OF 1929 IN 1930.

Nest A.—The same pair, 81 and 82, returned to their burrow and were successful in rearing their young one. As usual, they deserted it in the end, but I was unable to keep up a continuous observation.

Nest B.—The same pair, 90 and 83, were present on some days in the latter half of March and this season were successful in rearing a young bird. It was most interesting to find the intruder of last year, 100, also present on some days. In fact, the promiscuity in this burrow before 90 and 83 began to sit was extraordinary. Thus, on March 22nd I found 90 and 83 alone together; on the 26th no birds; on the 27th 100 alone; on the 29th 100 and an unringed bird which I ringed 101; on the 30th 83 and 101 together! This was the night of the heather fire, and when I examined the nest at 10 p.m. I found 83 and 101 still together in the recess, but while I was watching another bird suddenly arrived with a thump upon the turf, four yards from the entrance to the burrow. It was 100!

On the 31st my surmise that 100 had a new mate in 101 was rather upset by finding 101 and a new (unringed) bird in the nest, as also on April 1st and 2nd; none on the 3rd; 100 was alone on the 4th. On May 5th I was further bemused to find 89 and 84 sitting together in the recess (84, it may be recalled, was mate last year of 92 in nest D, which is situate some dozen yards from nest B), while a few inches along the passage was 101! After this, however, 83 and 90 remained in more or less complete possession, and this year had better fortune with their egg.

Nest C.—On March 26th, 99 was with an unringed bird, but on the 29th and 30th was with its mate of last year, 88. This burrow was in disrepair and was trodden in by sheep on the 31st.

Nest D.—This fell in during the winter. 84 (see nest B) alone recorded.

Nest E.—This burrow was lengthened by rabbits and deepened at least another two feet to run under a rock, so that I could seldom reach any birds that may have been present. I could sometimes touch their bills (and get duly rewarded). On March 30th and 31st there was a pair of which I managed to catch one, which proved to have no ring. This was a favourite burrow with rabbits, but I found a nestling Shearwater nearly fledged in this nest on September 4th.

Nest F was unoccupied, the passage being shorter than ever this year.

Nest G fell in during the winter, the trap-door sod giving way as in nests C and D.

It is unwise to draw definite conclusions from such a limited observation, but there is at least every evidence for and none

against stating that the Shearwater pairs for life. Witness the return of 81 and 82 in nest A ; of 90 and 83 in nest B, where also 89 and 100 returned, and of 88 and 99 in nest C.

What does the promiscuity in early spring point to? Do all these birds in the season of courtship merely use the burrow haphazardly as a hiding-place during the day?

Another interesting observation was that while the moon was waxing from April 3rd to the 7th hardly any birds remained in the holes by day. In fact, I found no birds at all on the 3rd, 6th and 7th in eleven nests I opened. Correlatively, not more than half, at a very rough estimate, landed at night during that period.

FOOD.

Several people were interested enough to write and ask if I could investigate the food of the Shearwater. The *Practical Handbook* gives "small fish (sprats, etc.) and offal of fish ; also jaws of cephalopods found in stomach". It has often been stated that they eat sorrel and beetles. Sheep's sorrel (*Rumex acetosella*) grows very plentifully around every burrow and I found the dried stems in several nest-linings. It may be that the birds cut down and swallow a certain amount of the short stems of this dwarf plant when they are sitting outside their holes, and perhaps they may pick up the beetles which are found in and about almost every rabbit-hole, although I have not seen them do either.

In my first paper I stated and proved that the nestling was deserted from about the sixtieth day, thereafter receiving no food. Although I have examined the stomachs of one or two fledged youngsters and always found them empty, I wished to have this observation confirmed by more expert opinion. Dr. C. B. Ticehurst kindly consented to examine and report. Of two young birds, caught and killed outside their holes as they stood midnight "vigil" preparatory to their first flight to the sea, on August 16th, and which I sent to him, the stomachs proved empty.

In August and September, when by day the holes are occupied only by downy nestlings, it is not difficult to wait for and catch the parents coming in at night to feed these young. They are quick to enter the burrows and to give the nestlings the entire contents of their stomachs before they settle down to the usual noisy conversation between all three (parents and young). When caught before entering it is a matter of seconds only before they throw up this burden of semi-digested food. Some of the adults which I caught disgorged before I could prevent them, and this, I think,

accounts for Dr. Ticehurst finding the stomachs of three out of five adults which I sent him practically empty.

Dr. Ticehurst reports:—

“Of seven Manx Shearwaters received, two were young birds fully grown with a trace of down still on the nape. Five were adults.

STOMACH CONTENTS.

Both the young birds' stomachs were empty. One adult had a full stomach, one was partly full, the rest were empty or practically so.

The contents consisted of a white, semi-fluid, grumous mass, semi-digested. On examination this proved to consist entirely of fish remains which smelt strongly of herring and there is little doubt that young herring had formed the food supply. There were present a few Nematode worms. I am indebted to Mr. Stevens of the Royal Scottish Museum for confirmation.

Note I.—The stomach of the Manx Shearwater, or rather the proventriculus, is an enormously dilatable sac, which when full fills up the entire body cavity. The gizzard is in comparison a tiny affair, about one inch in diameter, and not markedly muscular. In each case it was practically empty and presumably its only function is to arrest such fish bones as are undissolved.

Note II.—Unlike the Storm-Petrel, in which species it is not uncommon, I failed to find any trace of a right ovary in the Manx Shearwater.

CLAUD B. TICEHURST.”

MOULT.

I am also indebted to Dr. Ticehurst for the following extremely interesting and significant note.

“These adult Shearwaters on August 16th proved to be in a completely fresh moulted state of plumage, every feather having been moulted. As their young had not yet left their nest-burrows, this advanced state of post-nuptial moult is remarkable and could only happen in a species where the incubation- and fledging-periods are prolonged. I can recall no other case where the adults are practically through the moult before the young are fully fledged.”

YOUNG BIRDS' FLIGHT TO SEA.

Where the cliff was more shelving than steep I noticed that some of the young birds suffered severely in their efforts to reach the sea, especially where there was no wind. The weaker birds crashed heavily on the sharp rocks all the way down. Though most of them reached the sea alive, I found several stunned, two killed, and two fallen into crevices out of which they could never expect to scramble.

On September 25th at 3.30 p.m. I saw a young bird come out of a hole and flutter along towards the cliffs, only to fall into another rabbit-hole near the edge. This is the only time I have seen a Shearwater make a deliberate diurnal movement above ground, and in this case it was undoubtedly prompted by that overpowering urge to reach the sea which all these starved deserted fledglings possess.

NOTES ON THE BIRDS OF SCILLY.

BY

A. W. BOYD.

SINCE Clark and Rodd's paper on the Birds of Scilly in the *Zoologist* of 1906 there have been several short papers on them in *British Birds*: by Mr. H. M. Wallis (Vol. XVII., p. 55 and Vol. XVIII., p. 73), by myself (Vol. XVIII., p. 106) and by Mr. and Mrs. Seton Gordon (Vol. XXIII., p. 18).

In 1920 I spent the last ten days of September in Scilly, and was there for ten days from September 12th to 21st this year—ten years later.

Notes made on each occasion show that the status at this time of year of many species, both resident and migrant, is apparently quite unchanged. The normal residents: Song-Thrush, Blackbird, House-Sparrow, Stonechat, Linnet, Robin, Hedge-Sparrow, Wren, Rock-Pipit, etc., and the partly-resident: Greater Black-backed and Herring-Gulls, Shags, etc., were just as abundant as ever.

Other species were noted in practically the same numbers as ten years ago: Starlings, not numerous, but in fair numbers; Sky-Larks and Meadow-Pipits, fairly common; Wheatears and Swallows, common; House-Martin, seen only once in each year; and waders, such as Dunlin, Sanderling, Redshank, Curlew, Oyster-Catcher, Turnstone, Ringed Plover, with exactly the same comparative frequency.

Some idea of the limited number of species to be seen in Scilly may be gathered from the fact that we observed on the islands and the sea near by only sixty-eight to seventy species during these ten days, though the actual number of birds seen was very considerable. Most common migrating Passeres were almost altogether absent—only three Willow-Wrens or Chiffchaffs were seen and Common Redstarts twice.

The following notes may be of interest.

CHAFFINCH (*Fringilla c. cœlebs*).—A few on Tresco only; never more than four together.

CROSSBILL (*Loxia c. curvirostra*).—My wife called my attention to three—one a crimson male—feeding within four yards of us on thistle heads on St. Mary's on September 12th. The keeper on Tresco told me that on September 9th he saw a flock feeding on thistles that he estimated to be fully 200 and that prior to that he had seen a few—exactly how long before he could not remember; he attributed to them attacks on some of the apples. Clark and Rodd record them in 1868 and 1901.

WHITE WAGTAIL (*Motacilla a. alba*).—Common on five islands visited. On September 18th they were particularly noticeable on St. Agnes and Gugh, scattered everywhere over the heather-clad headlands and

beaches. I did not identify a single Pied Wagtail satisfactorily; all the adult birds I saw were undoubtedly *alba*. Clark and Rodd: "not uncommon casual autumn visitor coming over with the migrant flocks of Pied Wagtails."

GREY WAGTAIL (*Motacilla c. cinerea*).—On September 19th and 20th at Holy Vale, St. Mary's.

GREAT TIT (*Parus major newtoni*).—Repeatedly seen on three islands. The species seems to have made a slight, but definite, increase.

SEDGE-WARBLER (*Acrocephalus schænobaenus*).—One on St. Mary's, September 17th.

GREENLAND WHEATEAR (*Enanthe æ. leucorrhoa*).—Among the numbers of migrating Common Wheatears on September 18th on Gugh I watched a cock feeding with a cock Common Wheatear and the difference in size and brightness was most evident. Doubtless others of the scores of passing Wheatears seen in the islands were also of this form. Clark and Rodd do not mention the Greenland Wheatear.

SPOTTED FLYCATCHER (*Muscicapa s. striata*).—Seen on St. Mary's four times between September 12th and 20th—not more than two together. Clark and Rodd: "probably a regular autumn visitor."

PIED FLYCATCHER (*Muscicapa h. hypoleuca*).—On September 13th and 15th several together on Tresco. On September 14th and 20th on St. Mary's. Clark and Rodd: "occur not infrequently in twos and threes during autumn migration."

SAND-MARTIN (*Riparia r. riparia*).—One with Swallows on St. Mary's on September 17th. Clark and Rodd: "a casual bird of passage in spring and autumn."

KINGFISHER (*Alcedo a. ispida*).—One at Porth Hellick, St. Mary's, on September 17th.

PINTAIL (*Anas a. acuta*).—One, a brown bird, on September 16th, on the Abbey Pool, Tresco. Clark and Rodd: "appear only in severe weather."

WIGEON (*Anas penelope*).—Two on the Long Pool, Tresco, on September 15th.

LITTLE GREBE (*Podiceps r. ruficollis*).—One on the Long Pool, Tresco, on September 13th.

TURTLE-DOVE (*Streptopelia t. turtur*).—One on St. Mary's on September 20th. Clark and Rodd: "occurs rarely in autumn."

RUFF (*Philomachus pugnax*).—A young and tame bird on September 15th by the fresh-water pool on Bryher, where I saw two in September, 1920. Clark and Rodd record three immature birds. It is, perhaps, worth adding that on September 22nd, on our return to Cornwall, we saw another very tame bird in similar plumage on Marazion Marsh, near Penzance.

GREENSHANK (*Tringa nebularia*).—Several on St. Mary's on September 12th and again later. One on St. Agnes on September 18th.

WHIMBREL (*Numenius ph. phaeopus*).—One only on St. Agnes on September 18th. A boatman called it a "Harvest-Curlew", a name I have not known before. Clark and Rodd say that it was plentiful ninety years ago in early autumn, but by 1906 few in autumn.

TURNSTONE (*Arenaria i. interpres*).—It should, I think, be put on record that Mr. C. J. King, in a booklet *Wild Nature in Scillonian*, most emphatically denies that he has seen the Turnstone nesting in Scilly—statement attributed to him in Clark and Rodd's list.

COMMON GULL (*Larus c. canus*).—Seen only once—several on the

Abbey Pool, Tresco, on September 16th. In September, 1920, also, I saw Common Gulls only once—several on September 28th on St. Martin's. Clark and Rodd: "small winter parties seem to be not uncommon."

LESSER BLACK-BACKED GULL (*Larus fuscus graellsii*).—Very few seen: twice on St. Mary's on September 14th, but one of these looked like *L. fuscus fuscus*, or possibly *intermedius*. On September 18th I saw perhaps six *graellsii* on St. Agnes. Clearly Clark and Rodd's statement: "most abundant all the year round" is incorrect. (See also *Brit. Birds*, Vol. XXIII., p. 19).

SANDWICH TERN (*Sterna s. sandvicensis*).—Two on a rock at St. Martin's on September 15th and two flying between St. Mary's and Tresco on September 21st.

INCUBATION AND REARING OF YOUNG BY WOOD-PIGEON.

BY

LT.-COL. B. H. RYVES.

WITH reference to previous notes on the subject (Vol. XXII., pp. 205, 208 and 332) the following further details may be of interest.

On the morning of September 6th, 1930, after two hours' work, a pair of Wood-Pigeons (*Columba p. palumbus*) completed the construction of their nest, built on top of the old one, in which two young had been successfully reared during the previous June. The nest was in full view from a window of my house.

The male was the sole selector and carrier of material to the hen on the nest, and she was the sole constructor. In the case of both nests, numerous dead needles of the *Pinus insignis* were taken as lining. Only one needle at a time was carried and was held at the base with the leaves lying on each side of the bird's neck, the tips pointing towards this tail.

On the same afternoon (the 6th) the first egg was laid, but I did not record the date on which the second was deposited.

From then, throughout the periods of incubation and brooding the nestlings, the nest was never vacant except for the minute or less occupied in one bird relieving the other. The hen undertook the night work, the male brooding for considerably the greater part of the day.

On the occasions that I watched the nest through the whole of the day-time, the hen was relieved by the male about 10 to 11 a.m. The latter then brooded steadily till the hen took on again some time in the afternoon, after which there was no further relief.

I could identify one bird from the other by the male's broader neck patches and greater size, readily distinguishable when the two birds were seen close together during the nest-building and reliefs. I had noted these differences previously, when they mated. The distinctions were perhaps hardly sufficient to make identification with absolute certainty when one bird was seen entirely alone, though I reckoned that, even then, I could recognize one from the other.

On September 23rd—seventeen days after the first egg had been laid—one egg was hatched. I cannot definitely say when the other egg was hatched, but I feel fairly certain that this occurred on the 24th, for on the 25th I observed

that two nestlings were being fed, and neither of them gave me the impression of being a very recently hatched bird.

According to H. Saunders, two to three days elapse before the second egg is laid. Of the several nests with young that I have closely watched I have not been able to detect any such difference in size and development of the chicks as would indicate any considerable disparity in their ages. These observations have led me to the belief that the Wood-Pigeon must be at least capable of laying on consecutive days.

On October 4th full-brooding ceased, the chicks being left for an hour. The glasses showed me no apparent difference in their size or development. From the 5th to 8th inclusive the intervals between brooding steadily increased until, on the 9th, day-brooding entirely ceased. On the 11th night-brooding also ceased.

On October 15th one youngster quitted the nest and perched on a branch a few feet distant, but returned for the night. On the 16th both perched outside the nest, and, from then onwards, spent the day on and out of the nest. On the 20th they roosted for the first time out of the nest.

When food was brought the parent invariably flew direct to the nest, to which the youngsters fluttered from wherever they happened to be perched.

On the 27th, for the first time, they were fed on a branch about 12 feet away. Beyond flapping of the wings the feeding took place in complete silence.

On the 28th, in the morning, they were fed on the same branch again. About 2 p.m. I saw them suddenly take wing and fly with extraordinary strength and speed to a distant wood. This full "adult-flight" seemed surprising in view of the fact that, except for occasional short jumps and flutters, they had never before used their wings. The eldest fledgling was 35 days old when the two birds thus quitted the nest-tree in full flight.

During the last three days of their stay I heard them, soon after it became light, utter very low and soft cooing notes. The parents roosted nowhere in the vicinity of the nest.

On the 29th the two fledged birds returned to the nest-tree and remained until and including the 31st. On November 1st they had gone and I did not see them again.

It may be worth mentioning that, during incubation, the relieved bird departed, on several occasions, with a sharp wing-clap, but I never heard the "clap" when there were young in the nest.

RECOVERY OF MARKED BIRDS.

(Continued)

No.	Place and Date Ringed.	Place and Date Recovered.
MANX SHEARWATER (<i>Puffinus p. puffinus</i>).		
AE.681	Skokholm (Pemb.), 9.5.29, ad., by R. M. Lockley.	Where ringed, 29.3.30, by ringer.
AE.683	Ditto ditto.	Ditto 22.3.30.
AE.682	Ditto 15.5.29.	Ditto 29.3.30.
AE.684	Ditto ditto.	Ditto 5.5.30.
AE.688	Ditto 16.5.29.	Ditto 29.3.30.
AE.689	Ditto 17.5.29.	Ditto 5.5.30.
AE.690	Ditto 18.5.29.	Ditto 22.3.30.
AE.700	Ditto 20.5.29.	Ditto 27.3.30.
AE.699	Ditto 26.5.29.	Ditto 26.3.30.
WOOD-PIGEON (<i>Columba p. palumbus</i>).		
77652	Scone Estate (Perths.), 13.5.26, by Lord Scone.	Near where ringed, 15.10.30, by R. B. Bullock.
RR.8607	Ditto, 26.6.29, nestling.	Near where ringed, August, 1930, by ringer.
RR.1960	Glenorchard (Stirling.), 3.5.29, nestling, by J. Bartholomew.	Bishopbriggs, near Glasgow, April, 1930, by C. A. Scott.
RR.4083	Kirkmahoe (Dumfries.), 11.5.28, nestling, by W. and A. B. Duncan.	Auld girth (Dumfries.), 21.7.30, by T. McNaught.
22324	Penrith (Cumb.), May, 1926, young, by H. J. Moon.	Where ringed, 29.7.30, by W. Head.
25824	Ditto July, 1929.	Near Wolverhampton, 22.2.30, by A. H. Dun-calfe.
TURTLE-DOVE (<i>Streptopelia t. turtur</i>).		
RR.4473	Near Gt. Budworth (Ches.), 8.7.29, ad., by A. W. Boyd.	Where ringed, 25.6.30, by ringer.
OYSTER-CATCHER (<i>Haematopus o. ostralegus</i>).		
RS.3730	Skokholm (Pemb.), 25.6.30, young, by H. F. Witherby.	Mesquer (Loire Inférieure), France, 12.9.30, by R. Gourdet.
LAPWING (<i>Vanellus vanellus</i>).		
R.3172	Comrie (Perths.), 5.6.30, by Lord Scone.	Newbury (Berks.), 11.10.30, by F. B. Cleak.
W.5724	Near Glen Clova (Forfar.), 6.6.27, young, by T. L. Smith.	Kirriemuir (Forfar.), 21.4.30, by D. Cameron.
V.7690	Lethnot (Forfar.), 18.7.27, young, by H. G. Watson.	Where ringed, April, 1930, by ringer.
U.1369	Arbigland (Kirkcudbr.), 11.5.28, young, by Lord Scone.	Where ringed, 25.3.30, by J. Calson.

No. *Place and Date Ringed.* *Place and Date Recovered.*

LAPWING (*continued*).

Y.7712	Glenorchard (Stirling.), 14.6.25, young, by J. Bartholomew.	Where ringed, April, 1930, per ringer.
X.7307	Ditto 8.6.26.	Campsie Hills (Stirling.), 31.3.30, by G. G. Mac- donald.
Z.4965	Ditto 13.6.24.	Borrisokane (Tipperary), 24.12.29, by E. Wood.
T.8173	Penrith (Cumb.), May, 1929, young, by H. J. Moon.	Near Carlisle (Cumb.), Oct. or Nov., 1929, by Mr. Wallace, per ringer.
U.4832	Ditto May, 1928.	Kilmore (Tipperary), Jan., 1930, by T. Hogan.
S.2114	Ullswater (Cumb.), June, 1929, young, by H. J. Moon.	Near Whitchurch (Salop.), 1.12.30, by F. Lowe.
T.8119	Kirkby Lonsdale (Westmor- land), May, 1929, by H. J. Moon.	Skelmersdale (Lancs.), Oct., 1930, by J. Yates.
U.8789	Sedbergh (Yorks.), June, 1928, young, by H. J. Moon.	Near Tebay (Westmorland), 20.5.30, by T. B. Wright, per A. Astley.
V.3775	Raughton Head (Cumb.), 10.6.27, nestling, by R. H. Brown.	Aspatria (Cumb.), August, 1930, by J. N. Johnson.
V.6992	Troutbeck (Cumb.), 24.5.28, young, by L. W. Streat- field.	Carlisle (Cumb.), August, 1930, by W. Gate.
U.3684	Middleton - in - Teesdale (Yorks.), 13.5.28, young, by Lt.-Col. Pollitt.	Where ringed, March, 1930, by F. Wilkinson.
U.4008	Newchurch - in - Pendle (Lancs.), 17.5.28, nestling, by D. F. Jopson.	Blackburn (Lancs.), 18.7.30, by J. R. Sumner.
T.6079	Near Northwich (Ches.), 3.6.29, young, by A. W. Boyd.	Where ringed, 28.3.30, by J. Moore.

REDSHANK (*Tringa t. totanus*).

R.6330	Rockcliffe Marsh (Cumb.), 17.5.30, nestling, by R. H. Brown.	Polbathic (Cornwall), 24.7.30, by A. Gayson.
T.5980	Hickling (Norfolk), 23.5.29, ad., by A. W. Boyd.	Where ringed, 24.4.30, by J. Vincent.

CURLEW (*Numenius a. arquata*).

RR.3909	Almond bank (Perths.), 15.6.29, nestling, by Lord Scone.	Ballylongford (Kerry), 15.6.30, by T. O'Sullivan.
AB.487	Penrith (Cumb.), May, 1929, young, by H. J. Moon.	Tralee (Kerry), 7.9.30, by K. Reilly.
AH.421	Near Skirwith (Cumb.), 15.6.30, nestling, by R. H. Brown.	Killarney (Kerry), 14.10.30, by W. Shanahan.

No.	Place and Date Ringed.	Place and Date Recovered.
SNIPES (<i>Capella g. gallinago</i>).		
RR.8131	Longtown (Cumb.), 25.3.29, by Sir R. Graham.	Abbey Leix (Queen's Co.), 17.2.30, by Mrs. Bland.
WOODCOCK (<i>Scolopax r. rusticola</i>).		
S.9349	Coupar - Angus (Forfar.), 21.5.30, nestling, by Lord Scone.	Meigle (Perths.), 2.10.30, by J. K. Cassels.
U.5892	Ditto 11.5.29.	Where ringed, 28.11.30, by W. N. Graham-Menzies.
V.1530	Scone Estate (Perths.), 27.7.27, young, by Lord Scone.	Near Kenmare (Kerry), 8.1.30, by T. Clifford.
X.4273	Almond bank (Perths.), 27.5.26, nestling, by Lord Scone.	Tullybeagles (Perths.), 14.8.30, by J. Frazer.
X.4463	Strathord (Perths.), 5.6.26, nestling, by Lord Scone.	Glenalmond (Perths.), 17.10.30, by J. Ferguson.
W.8751	Meigle (Perths.), 4.5.27, young, by C. Walker.	Near where ringed, 31.12.29, by R. Kinloch-Smyth.
V.6642	Murthly (Perths.), 9.6.28, young, for Lord Scone.	Where ringed, Nov., 1930, by H. J. Grierson.
S.7767	Dalswinton (Dumfries.), 19.5.30, nestling, by Lord Scone.	Penpont (Dumfries.), 25.10.30, by H. Gladstone.
U.6433	Kirkmichael (Dumfries.), 9.6.28, nestling, for W. and A. B. Duncan.	Near where ringed, 1.11.30, by C. Logan.
U.6539	Alnwick (Northumb.), 7.5.30, young, by Duke of Nor- thumberland.	Near where ringed, 28.11.30, by ringer.
W.8781	Abbeystead, Lancaster, June, 1927, young, by H. W. Robinson.	Wray, Lancaster, 1.11.30, by L. A. Smith.
SANDWICH TERN (<i>Sterna s. sandvicensis</i>).		
V.4674	Farne Is. (Northumb.), 4.7.30, young, by Mrs. T. E. Hodgkin.	Banff, 25.8.30, by W. W. Gardiner.
S.5895	Walney I. (Lancs.), 5.6.29, young, by H. W. Robinson.	Mossamedes, Portuguese West Africa, July, 1930, by H. E. O. Gilbert and <i>Seculo</i> .
S.6802	Salthouse (Norfolk), young, 1.7.29, by R. M. Garnett.	Port Elizabeth, S. Africa, Jan., 1930, by B. W. Jordan.
T.6253	Blakeney Point (Norfolk), 13.7.29, young, by A. W. Boyd.	Ivory Coast, French West Africa, Feb., 1930, by M. G. Constantin.
S.7355	Scolt Head (Norfolk), 7.7.30, young, by R. M. Garnett.	Near St. Valery-sur-Somme, France, 2.9.30, by d'H. de Saint-Sulpice and Centre Nat. de Recherches Agron., Versailles.

No.	Place and Date Ringed.	Place and Date Recovered,
SANDWICH TERN (<i>continued</i>).		
S.9954	Scolt Head (Norfolk), 28.6.30, young, by A. W. Boyd.	I. of Amrum, Norddorfer- strand, Germany, 23.8.30, by Dr. H. Kirchner.
S.5098	Ditto	ditto. Grandcamp-les-bains (Cal- vados), France, mid-Octo- ber, 1930, by M. Dubosq.
S.4975	Ditto	ditto. Vila Real de Santo Antonio, south Portugal, 25.11.30, by D. Whiting.

COMMON TERN (*Sterna h. hirundo*).

4366	Ainsdale (Lancs.), 2.7.21, nestling, by F. W. Holder.	Burgh Head (Moray), 5.5.30, by L. Gordon.
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BLACK-HEADED GULL (*Larus r. ridibundus*).

30870	Ravenglass (Cumb.), 13.6.10, young, by H. W. Robinson and F. W. Smalley.	Where ringed, May, 1930, by W. Marchant.
28733	Ravenglass (Cumb.), 17.5.13, young, by H. W. Robin- son.	Nr. Spalding (Lincs.), 8.12.30, by A. K. Maples.

COMMON GULL (*Larus c. canus*).

RR.2895	Loch Craignish (Argyll), 1.6.28, nestling, by P. K. Chance.	Carndonagh (Donegal), 1.11.30, by E. O'Doherty.
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HERRING-GULL (*Larus a. argentatus*).

AE.613	Walney I. (Lancs.), 15.6.30, young, by H. W. Robinson.	Dalton-on-Tees, 28.8.30, by W. Houndell.
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LESSER BLACK-BACKED GULL (*Larus f. graellsii*).

AG.115	Rockcliffe Marsh (Cumb.), 25.7.29, nestling, by R. H. Brown.	Casablanca, Morocco, 3.2.30, per Compagnie Fruitière de Maroc.
AL.146	Ditto	4.7.30. Marinha Grande, Portugal, 19.10.30, by H. E. O. Gilbert and <i>Diario de</i> <i>Noticias</i> .
26459	Foulshaw (Westmorland), 7.7.27, young, by H. W. Robinson.	Near where ringed, 4.5.30, by E. U. Savage.

GREAT BLACK-BACKED GULL (*Larus marinus*).

104214	Maughold Head (I.O.M.), 2.7.29, young, by F. A. Craine.	Eastriggs (Dumfries.), 29.5.30, by R. Robertson.
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No.	Place and Date Ringed.	Place and Date Recovered.
RAZORBILL (<i>Alca torda</i>).		
RS.3953	Handa I. (Suth.), 3.7.30, young, by E. Cohen.	Kristiansand, S. Norway, 26.10.30, by T. Henriksen.
RS.3993	Ditto.	Ditto, by L. N. Marcussen.
RS.3962	Ditto.	Off Oxö Light, Kristiansand, 15.10.30, by B. Reinharth.
RS.3959	Ditto.	Tvedestrand, S. Norway, 31.10.30, by T. Tallaksens.
RS.3954	Ditto.	Roile Klint, Little Belt (Jylland), Denmark, 7.11.30, by C. C. Andersen.

PUFFIN (*Fratercula a. grabæ*).

AD.162	Orkney, June, 1928, young, by H. W. Robinson.	Where ringed, May, 1930, by ringer.
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LAND-RAIL (*Crex crex*).*

S.9180	Scone Palace, Perth, 28.6.30, nestling, by Lord Scone.	Commune de Fresselines (Creuse), France, 14.9.30, by A. Alamassée.
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* A Land-Rail ringed privately by Mr. C. Mulholland at Downpatrick (co. Down), Ireland, 20.7.29, was reported near Tours, France, 15.9.29 (*Irish Nat. Journal*, Vol. III., p. 55).

NOTES

INCUBATION- AND FLEDGING-PERIODS OF BRITISH BIRDS.

THE following cases during 1930 are for West Sussex :—

	Incubation- period in days.	Fledging- period in days.	Remarks.
GREENFINCH (<i>Chloris ch. chloris</i>)	13	—	5 eggs : 2 young reared.
GOLDFINCH (<i>Carduelis c. britannica</i>)	13*	14-15	5 eggs : all young reared.
WILLOW-WARBLER (<i>Phylloscopus t. trochilus</i>)	12*	13-14	7 eggs : 2 young reared.
SEDGE-WARBLER (<i>Acrocephalus schænobænus</i>)	12*	—	5 eggs : none reared.
NIGHTINGALE (<i>Luscinia m. megarhyncha</i>)	—	11-12	5 eggs : all reared.
MOORHEN (<i>Gallinula ch. chloropus</i>)	20	—	6 eggs : all young reared.

All periods are calculated from the day on which the last egg was laid to the date of hatching of last egg.

In those cases marked with an asterisk hatching took place on two days.

RAYMOND CARLYON-BRITTON.

The following data were obtained during 1930 in west Middlesex and north-west Surrey.

	Incubation- period in days.	Fledging- period in days.	Remarks.
GREENFINCH (<i>Chloris ch. chloris</i>)	14	11†	4 eggs : all young reared.
do.	—	Between 14-15 days.	5 eggs : 3 young reared.
do.	—	12†	5 eggs : 5 young reared.
BULLFINCH (<i>Pyrrhula p. nesa</i>)	13	12	5 eggs : 4 young reared.
CHAFFINCH (<i>Fringilla c. cælebs</i>)	—	14	4 eggs : all young reared.
do.	13	13	4 eggs : all young reared.
do.	12	—	5 eggs : all young reared.
do.	12	14	5 eggs : 3 young reared.
REED-BUNTING (<i>Emberiza s. schæniclus</i>)	—	13	5 eggs : 4 young reared.

	Incubation- period in days.	Fledging- period in days.	Remarks.
RED-BACKED SHRIKE (<i>Lanius c. collurio</i>)	Between 14 and 15 days.	—	5 eggs : 4 young reared.
SPOTTED FLYCATCHER (<i>Muscicapa s. striata</i>)	12	13	5 eggs : 4 young reared.
WHITETHROAT (<i>Sylvia c. communis</i>)	12	—	5 eggs : all hatched.
MISTLE-THRUSH (<i>Turdus v. viscivorus</i>)	14	Between 14-15 days.	4 eggs : 3 young reared.
SONG-THRUSH (<i>T. ph. clarkei</i>)	—	14	4 eggs : all young reared.
do.	—	14	4 eggs : all young reared.
BLACKBIRD (<i>T. m. merula</i>)	13	Between 12-13 days.	4 eggs : all young reared.
do.	13	—	3 eggs : all hatched.
do.	12	—	4 eggs : all hatched.
do.	Between 12 and 13 days.	—	4 eggs : all hatched.
do.	—	14	4 eggs : all young reared.
STONECHAT (<i>Saxicola t. hibernans</i>)	—	Between 11 and 12 days.	5 eggs : 4 young reared.
ROBIN (<i>Erithacus r. melophilus</i>)	—	14	5 eggs : 3 young reared.
HEDGE-SPARROW (<i>Prunella m. occidentalis</i>)	12	13	3 eggs : all young reared.
do.	Between 12 and 13 days.	Between 12-13 days.	4 eggs : all young reared.
do.	—	Between 12-13 days.	4 eggs : 2 young reared.
do.	—	12	5 eggs : 3 young reared.
WREN (<i>Troglodytes t. troglodytes</i>)	14	17†	5 eggs : 1 young reared.

A nest of Blackbird with six eggs hatched as follows : three on May 18th, two on 19th, and one on 20th.

Where it is stated that hatching or fledging took place between two given days, this does not imply that it extended over one day, but merely that the event took place between the given dates.

T. H. HARRISSON.

W. R. HARRISSON.

† Young left nest when examined, and might have stayed one or more days longer if undisturbed.

INCUBATION- AND FLEDGING-PERIODS OF WREN
AND WOOD-WARBLER.

A NEST of Wood-Warbler (*Phylloscopus s. sibilatrix*) with five eggs contained young on July 6th, though the eggs were still unhatched on the afternoon of July 5th. The young were fed by both parents. On July 15th, instead of gaping for food, the young crouched in fear when approached, but were still in the nest on the 16th and had flown by the morning of the 17th; fledging-period ten days.

In the case of a Wren (*Troglodytes t. troglodytes*) the eggs were laid on consecutive days, but there was a pause of one day after the fourth egg in a clutch of five. The last egg was laid on June 19th; two were hatched on July 3rd and all by the 4th. The young flew from the nest when touched on July 19th, but one flew less strongly than the others. Incubation-period, fourteen days; fledging-period, sixteen days.

D. DEWAR.

IMMIGRATION OF CROSSBILLS IN 1930.

ALTHOUGH the immigration of Crossbills this year does not appear to be in such numbers as to warrant its being recorded in detail, the following notes which we have received may be added to those already given on pp. 155-6.

NORTHUMBERLAND AND DURHAM.—Mr. G. W. Temperley has made careful enquiries from which it appears that there were definitely fresh arrivals of Crossbills in small numbers in 1930. At Alnwick they were seen September 15th, 25th, October 11th; in Upper Redesdale July 2nd, 29th, August 6th, September 13th, 21st, 29th and November 14th; near Hexham September 6th, October 1st; at South Shields July 16th, mid-August and mid-September; in Tees Valley, August 1st and 24th.

YORKSHIRE.—Mr. J. C. S. Ellis is informed of a flock of about twenty near Flamborough about July 20th.

HERTFORDSHIRE.—Miss A. Hibbert-Ware saw a flock of about fifteen near Bishop's Stortford on November 26th.

HAMPSHIRE.—Mr. B. J. Ringrose saw about six in the New Forest on December 3rd.

DISPOSAL OF ADDLED EGGS BY TITS.

WITH reference to the various notes on this subject, Vol. XXIII., pp. 94, 95 and 128, and Vol. XXIV., p. 190, I am able to give the following experience which appears to be another instance of egg removal on the part of the birds.

One of my nesting logs this year (1930) was occupied by a Great Tit (*Parus m. newtoni*) and on May 8th contained six eggs slightly incubated. A further visit was made on May 10th, when I flushed the sitting bird, which, however, now revealed only five eggs.

The missing egg, proved later to be addled, I found on the ground undamaged and immediately below the nesting log, which was placed on a tree at a height of five feet.

The nest was in a very damp condition as the result of bad weather. D. W. MUSSELWHITE.

HEN-HARRIER IN KENT.

FROM many sources news has reached me of people seeing "Large Hawks" in Kent and especially north-east of Maidstone, near and on the North Downs. We know that one at least was a Honey-Buzzard shot at Rochester, *vide antea*, page 162.

On October 9th, 1930, a "Large Hawk" was shot in Boxley Parish and sent to me for identification; it was an immature male Hen-Harrier (*Circus cyaneus*) in beautiful condition; the stomach contained a complete House-Sparrow (*Passer d. domesticus*) with beak and legs. Apparently Harriers swallow small birds whole and without in any way first tearing them in pieces, afterwards ejecting the beak and legs. On the same occasion another "Large Hawk" was seen, but not identified. JAMES R. HALE.

OSPREY IN SUSSEX.

WITH reference to the recent notes on the Osprey, it may be of interest to note that during the first week in October, 1930, a bird of this species was unfortunately shot at Bucknill, near Lewes, Sussex.

B. T. BROOKER.

E. M. CAWKELL.

GOOSANDER IN BUCKINGHAMSHIRE.

ON Saturday evening, December 6th, 1930, while waiting for the evening flight of duck near Langley, Slough, I shot what I took to be a Mallard from a group of three birds which came in to the pond. On picking the bird up, however, I found it to be a Goosander (*Mergus m. merganser*), a young male in its first winter plumage; weight 3 lbs. 6 ozs. Though Goosanders are common in winter at Staines and Tring Reservoirs on the borders of Buckinghamshire there are few suitable places for them actually within the county and thus not many records. I have presented the specimen to the British Museum. G. CARMICHAEL LOW.

[Six were observed in January and two in March, 1929, at the Weston Turville Reservoir by Mr. C. Oldham (*Report Oxford Orn. Soc. for 1929*, p. 36).—EDS.]

BLACK-NECKED GREBE BREEDING IN YORKSHIRE.

AFTER the publication last month of the exceedingly interesting notes on the Black-necked Grebe (*Podiceps n. nigricollis*) in Ireland, contributed by Mr. Stoney and Mr. Humphreys and followed by the Editor's supplementary account of its status as a breeding species in Great Britain, I feel that it ought to be put on record that this bird has attempted to establish itself during recent years on a large sheet of water in central Yorkshire. The discovery was first made by my friend, Mr. C. E. Rhodes, of Stapleton, who informed me early in July, 1928, that he had found, that season, several nests of a Grebe intermediate in size between the Little Grebe and the Great Crested. The exact locality he does not wish me to divulge, and it is probably better that it should not be generally known.

The first nest was found on May 25th and contained a single fresh egg. A second nest found on May 30th contained two fresh eggs and a third nest on June 18th held four eggs, probably about half incubated. In no case was the bird belonging to the nest seen or identified. Judging by the relative size of the eggs only, my friend had come to the conclusion that both the Black-necked and Slavonian Grebe were represented. The improbability of the latter species extending its range so far south renders such a supposition most unlikely, and to my mind it is far safer to assume a slight variation from the normal size of Black-necked Grebe's eggs unless and until definite proof to the contrary can be obtained.

Being exceedingly anxious to amplify these interesting records, I arranged, in spite of the lateness in the season, to pay a visit to the locality at once. Accordingly, Mr. Rhodes and I visited it together on July 14th, spending some four or five hours on the sheet of water searching the sedge beds and observing the birds. Observation was rendered difficult by exceptionally brilliant sunshine and by the extraordinary number of water-fowl, including countless young in all stages of growth, which crowded the water in and around the edges of the very extensive sedge beds. I saw a pair of what I took to be Black-necked Grebes and succeeded in getting one of them well in focus in my glasses before they disappeared into the sedges on the edge of which they were swimming. I got a clear view of the bright yellowish-chestnut ear-tufts and of the black cheeks and throat, so that I had no doubt as to the identification of this bird as a

Black-necked Grebe. This was all that we saw of the birds themselves. Nearly a quarter of a mile away from the point where this bird was identified we found a nest which I am confident was a Black-necked Grebe's containing a single egg just chipping. Fragments of shell in the nest showed that other eggs had already hatched off. This nest was a bulky structure attached to floating willow branches on the edge of a bed of sedge. It was so placed that the bird could approach it unobserved and therefore though we waited and watched a considerable time we were unable to get a sight of it. I took the exact dimensions of the single egg remaining in the nest and append these together with those of the other seven eggs above referred to.

It is quite apparent from a glance at these eggs that they are not eggs of the Great Crested or Little Grebe, and the fact that they were found in four different nests quite precludes the possibility of their being the product of a bird of either species laying abnormal eggs. This was the only intermediate Grebe's nest we were able to find on the visit in question, though, in spite of the late date, we found seven nests of the Great Crested Grebe and three of the Little Grebe still containing eggs.

Unfortunately, the bird appears to have failed to have established itself. Three subsequent visits to the locality on May 15th and June 1st in 1929, and on May 17th, 1930, failed to reveal any further trace of them, though on each occasion Mr. Rhodes and I made a thorough search. Sixteen or seventeen nests of the Great Crested Grebe and one or two of the Little Grebe were noted on each visit.

The measurements in millimetres of the eggs above referred to are as follows:—

May 25th, 1928		45.21 × 33.02
May 30th, 1928		43.94 × 29.72
		44.45 × 29.97
June 18th, 1928	4/c	42.67 × 32.76
		43.18 × 29.72
		42.42 × 28.96
		42.67 × 29.72
July 14th, 1928		45.72 × 33.02

ARTHUR WHITAKER.

BLACK-NECKED GREBES IN HERTFORDSHIRE.—*Correction.*—On page 175 it was stated that Mr. Pike photographed a pair in 1920. We are informed by Mr. Pike that this is an error

due to a confusion of dates, and that he photographed the birds only in 1919. The statement for 1920 should therefore read that certainly one pair (and possibly two) were present in the summer of 1920, but no young were known to hatch.

BIRDS IN IRELAND.

MR. G. R. HUMPHREYS kindly communicates the following items of interest which have appeared from time to time in *The Irish Naturalists' Journal* from its commencement in 1925 to the end of 1930, and of which no notice has hitherto appeared in our pages. Those records which we think require confirmation have been enclosed within square brackets.

ROSE-COLOURED STARLING (*Pastor roseus*).—One at Inishtrahull Lighthouse, September 18th, 1925 (J. S. Barrington, Vol. I., p. 192). No record since 1899.

TREE-SPARROW (*Passer m. montanus*).—Belmullet colony appears not now to exist (R. F. Ruttledge, Vol. II., p. 31). In 1929 the light-keeper at Blackrock, an island nine miles west of the coast of Mayo, reported that a pair of Tree-Sparrows were breeding there and a young bird with wing-feathers partially grown was sent to Mr. Humphreys. A colony breeding in the island of Inishtrahull off the north coast of Ireland was reported in 1913 (*Brit. B.*, Vol. VII., p. 38) by Professor Patten. (G. R. Humphreys, Vol. III., p. 39).

WHITE WAGTAIL (*Motacilla a. alba*).—Adult near Belmullet (Mayo), June, 1924 (R. F. Ruttledge, Vol. II., p. 30). Five or six, Lough Neagh (Armagh), April 30th, 1928 (J. A. Bennington, Vol. II., p. 55).

RED-BACKED SHRIKE (*Lanius c. collurio*).—One killed North Aran Lighthouse (Galway), October 3rd, 1927 (J. S. Barrington, Vol. II., p. 175). This, with the one recorded from the Rockabill Light in August, 1927 (see *Brit. B.*, Vol. XXI., p. 206), are the fourth and fifth Irish records.

PIED FLYCATCHER (*Muscicapa h. hypoleuca*).—Female, Rockabill Lighthouse (Dublin) on May 10th, 1928 (G. R. Humphreys, Vol. II., p. 224). Mr. Humphreys states that this is the nineteenth definite Irish record, not including one said to have been captured at Louisburgh (Mayo) on November 23rd, 1921 (*Field*, 10.xii.1921). The following should be added to those mentioned in the *Practical Handbook*, Vol. I., p. 292, and Vol. II., p. 893: Old Head, Kinsale (Cork), Inishtrahull (Donegal), and a sixth example from the Tuskar Light (Wexford). Most of these nineteen have been taken at lighthouses, fifteen between August 7th and October 9th and only four in spring (April 19th to May 10th).

CHIFFCHAFF (*Phylloscopus collybita*).—Two observed in winter each year from 1925 to 1928 at Glengariff (Cork). Frequently heard singing on warm days (J. E. Flynn, Vol. II., p. 180).

BARRED WARBLER (*Sylvia n. nisoria*).—One at North Aran Lighthouse (Galway) on October 8th, 1927 (J. S. Barrington, Vol. II., p. 175). This is the fifth Irish record. Only three were mentioned in the *Practical Handbook* (Vol. I., p. 361), but Mr. Humphreys points out that the late R. M. Barrington had three, not two, from the Rockabill Lighthouse, the dates being September 25th, 1896, September 17th, 1912, and September 1st, 1913 (see *Cat. Birds in Barrington Coll. in Nat. Mus., Dublin*, p. 24).

GARDEN-WARBLER (*Sylvia borin*).—One in song on an island in Lough Mask (Mayo), May 28th, 1928 (R. F. Rutledge, Vol. II., p. 109). A very local species in Ireland and not before observed in this locality.

SWALLOW (*Hirundo r. rustica*).—Nest with eggs in marine cave, Achill (Mayo) (R. F. Rutledge, Vol. II., p. 31).

WRYNECK (*Jynx t. torquilla*).—Male near Ballyhooly (Cork), November 14th, 1925 (Rohu & Sons, Vol. I., p. 115). Recorded seven times previously in Ireland. This is a very late date.

SNOWY OWL (*Nyctea nyctea*).—Female shot Belmullet (Mayo), June 15th, 1930. An unusual date (W. J. Williams, Vol. III., p. 111).

GREENLAND FALCON (*Falco r. candicans*).—One shot near Dundalk (Louth) early in 1926 and another Greenore (Louth) in September (W. H. Workman, Vol. I., p. 175). Two co. Cork, June, 1925, and December, 1926 (J. E. Flynn, Vol. II., p. 202).

[HOBBY (*Falco s. subbuteo*).—For three years in succession one visited Glengarriff (Cork). No proof of breeding or presence of mate. Bird not seen 1928 (J. E. Flynn, Vol. II., p. 224). Only ten previous records for Ireland.]

ROUGH-LEGGED BUZZARD (*Buteo l. lagopus*).—One caught in trap Luggala (Wicklow) early December, 1926 (W. J. Williams, Vol. I., p. 176). Eighteen previous occurrences in Ireland recorded.

NIGHT-HERON (*Nycticorax n. nycticorax*).—Male near Timoleague (Cork), May 6th, 1926 (Rohu & Sons, Vol. I., p. 115). Twenty-five previous records.

LITTLE BITTERN (*Ixobrychus m. minutus*).—One taken by cat Clonakilty Bay (Cork) on April 25th, 1929 (C. B. Moffat, Vol. II., p. 203). Another was shot near Downpatrick (Down) on November 1st, 1929 (J. A. Sidney Stendall, Vol. III., p. 39). About thirty previous records, chiefly from south and east.

VELVET-SCOTER (*Oidemia fusca*).—Pair stayed about a month in Glengarriff Bay (Cork), February, 1925, and a single bird was seen on January 24th, 1930. (J. E. Flynn, Vol. II., p. 201; Vol. III., p. 39). Rare winter visitor to Ireland.

[SURF-SCOTER (*O. perspicillata*).—One flying close with flock of Mergansers in January, 1926, in Glengarriff Bay (Cork), said to be this species (J. E. Flynn, Vol. II., p. 201). Evidence given for identification (viz., by white patches on the head) not sufficient to be certain.]

GANNET (*Sula bassana*).—Two pairs found nesting on Great Saltee Island (Wexford) in May, 1929 (H. Garnett, Vol. II., pp. 235-6). Previously known to nest in Ireland only at Bull Rock (Cork) and Little Skellig (Kerry).

FULMAR PETREL (*Fulmarus g. glacialis*).—Found breeding mainland Antrim, opposite Rathlin Island, early July, 1929 (J. A. Bennington, Vol. II., p. 224). Probably five pairs breeding (two chicks seen), Giant's Causeway (Antrim), and one pair at Port Moon, July, 1930 (A. R. Crawford, Vol. III., p. 111). Single bird seen Great Saltee Island (Wexford), May, 1929 (H. Garnett, Vol. II., pp. 235-6), but nesting not proved. First found breeding in Ireland in 1911, has now colonized a number of places on the north and west coasts and was recorded as nesting on Rathlin Island in 1921, while in 1930 it was proved to be breeding on the Great Saltee Island (*antea*, p. 195).

TURTLE-DOVE (*Streptopelia t. turtur*).—One near Dingle Bay (Kerry), June, 1928 (J. E. Flynn, Vol. II., p. 201). One Saltee Island (Wexford) May, 1929 (H. L. Garnett, Vol. II., pp. 235-6).

GREEN SANDPIPER (*Tringa ochropus*).—Single birds near Glengarriff (Cork), September, 1927 and 1928 (J. E. Flynn, Vol. II., p. 201).

AVOCET (*Recurvirostra avosetta*).—In 1928 in south of Ireland had "two pairs" under observation, on one occasion within 20 yards (J. Mackay, Vol. II., p. 160). It is unfortunately not stated in what month the birds were seen, nor how long they stayed.

BLACK-TAILED GODWIT (*Limosa l. limosa*).—Two killed Hook Tower Lighthouse (Wexford), July 16th, 1926 (J. S. Barrington, Vol. II., p. 50). "Large number" in summer dress stayed several days on south shore, Lough Neagh (Armagh) end April, 1928 (J. A. Bennington, Vol. II., p. 91).

BLACK TERN (*Chlidonias niger*).—Two seen Lough Mask (Galway), June 19th, 1927 (T. Gray, Vol. I., p. 275).

ROSEATE TERN (*Sterna dougallii*).—A pair identified amongst a colony of thirty pairs of Arctic Terns in north-west Mayo in June, 1924. Just possible there was a second pair. Had not started to nest (R. F. Ruttledge, Vol. II., p. 31). Not previously known from west Ireland.

GLAUCOUS GULL (*Larus hyperboreus*).—One shot North Aran (Galway), December 27th, 1927. Also reported Blackrock (Mayo). (J. S. Barrington, Vol. II., p. 176).

GOLDEN ORIOLE BREEDING IN SURREY.—We are informed that a pair of Golden Orioles (*Oriolus o. oriolus*) nested in 1930 in Surrey and reared a brood of four, which left the nest safely.

GREY PHALAROPE IN SOMERSET.—Mr. H. Tetley informs us that an example of *Phalaropus fulicarius* was found between Ilchester and Langport under telegraph wires on September 20th, 1930. This was the time of a heavy gale. The bird has now been added to the Bristol Museum collection.

LATE LITTLE TERN IN SKYE.—Mr. A. MacRae informs us that he identified a Little Tern (*Sterna albifrons*) which was busy diving near Dunvegan on October 15th, 1930.

LITTLE AUK INLAND IN KENT.—The Rev. J. R. Hale informs us that on November 13th, 1930, a Little Auk (*Alle alle*) was picked up in Boxley. When found the bird was alive, but died before being brought to Mr. Hale, who states that it proved to be a male and the stomach was empty, but the bird was uninjured. Mr. Hale adds that there was no special rough weather in the district from November 10th to 13th to account for the bird being so far inland.

LETTER.

BREEDING OF SHORT-EARED OWL AND MONTAGU'S
HARRIER IN IRELAND.*To the Editors of British Birds.*

SIRS,—Will you kindly allow me to reply briefly to one or two of the principal criticisms of my book, *A Bird Watcher's Note Book*, made in the December number of *BRITISH BIRDS*.

Your reviewer complains of several loose statements. For instance, he characterises "Short-eared Owls seem to be becoming increasingly common as a breeding species on many moors in Ireland" as an astounding statement without giving a shred of evidence.

The statement was based on the following facts: I found a nest of Short-eared Owls on a co. Kilkenny hill in June, 1927.

During the past few years I have put up several birds of this species out of the heather during July and August. On August 14th, 1930, for example, I disturbed three Short-eared Owls on a Tipperary mountain, one of which was undoubtedly a young bird. The keeper on this mountain told me that he had destroyed several nests during recent years. In May, 1929, an Owl shot near my place was brought to me for identification. It was a Short-eared Owl in breeding-plumage (in summer the plumage of these Owls is much paler than in winter).

The information about Hen-Harriers and Montagu's Harrier in Kerry was sent to me by a man who has studied birds all his life. Why, may I ask, should he take the trouble to write to me were it not a fact?

Since writing the book I have seen Dr. Landsborough Thomson's paper on ringing Woodcock. The information therein only tends to confirm the conclusions I have arrived at.

J. W. SEIGNE.

[We are very glad to receive from Major Seigne evidence for the breeding of the Short-eared Owl in Ireland, which is most interesting. As mentioned in our review, there was no record of the bird breeding in Ireland and, this being so, Major Seigne's statement, given without any details, was really valueless.

As regards the Harriers, we fear that we cannot accept as evidence of his correctness the fact that Major Seigne's correspondent took the trouble to write to him. Some real proof of correct identification and details of the nesting are certainly needed in the case of Montagu's Harrier.—EDS.]

REVIEWS.

History of the Birds of Norfolk. By B. B. Rivière. pp. xlviii, 296. With 16 Plates and Map of the County. H. F. & G. Witherby, 1930.

ENGLISH counties are extremely uneven in size, Yorkshire being more than double the size of its nearest rival, while Norfolk stands fourth on the list as regards acreage. It is now possible to estimate the ornithological output of each county with some accuracy, at any rate up to about 1918, from the lists of local literature published in the *Geographical Bibliography of British Ornithology*. Here, as might indeed be expected, Yorkshire takes a long lead, but second and third

places are closely contested by Sussex and Norfolk, the former county leading in 1918 by a very small margin. Dr. Rivière was therefore not faced with the difficulty which confronts the historian of some of the smaller counties, such as Monmouth, Huntingdon or Rutland, and in compiling the present history the problem has not been to collect sufficient material to justify publication, but to select the salient facts out of the vast mass of available matter.

Norfolk has been unusually fortunate in other respects, for its ornithological records go back to the seventeenth century. Sir Thomas Browne has left us invaluable sketches of a vanished time when Ravens were the recognised scavengers of the City of Norwich; Spoonbills and Cormorants nested in colonies in the woods of East Anglia, and Ruffs, Avocets and Godwits bred freely in the marshes. Moreover, much of its past history has been sifted and recorded in what was one of our best county avifaunas, *The Birds of Norfolk* by Stevenson and Southwell (1866-1890). The Annual Ornithological Reports published in the *Zoologist*, *British Birds* and the *Norfolk & Norwich Nat. Soc. Transactions* have also saved many records from oblivion and provided a useful index to the literature of each year.

The aim of the present work has been not so much to replace the *Birds of Norfolk* altogether as to provide a condensed account of what has already been recorded there in detail, to bring the work up to date by noting the remarkable changes which have taken place since 1870, and to investigate the identity of some of the accidental visitors in the light of present-day knowledge of geographical races. After carefully studying the present work we can state with confidence that this has been very well and thoroughly done. The reader will find duly chronicled the extraordinary changes which have taken place of late years in the status of the Harriers, the Bittern, certain species of Duck and particularly the Sandwich Tern.

Norfolk has always taken a prominent place as a shooting and game preserving county and is probably as efficiently kept as any county in England. In the past this was the cause of the disappearance of most of the birds of prey and the scarcity of several of the Crow family. The war years provided a respite, temporarily, for these birds, but when we read, as we frequently do, of the results of "Protection", it must be borne in mind that in the case of the Raptores, all that has really happened is the cessation of regular killing on a few limited areas. Even this scanty assistance has enabled the Harriers to re-establish themselves. The Bittern has benefited to some extent by the gradual change in public opinion as to the shooting of rare birds and the provision of reserves in which it was able to breed in peace. On the other hand, the Terns, breeding in colonies in restricted areas, have undoubtedly benefited greatly by actual protection during the breeding season.

It is, however, a somewhat strange anomaly that the presence of the Sandwich Tern on the Norfolk coast is almost certainly due to the wholesale raiding of their homes on the Farnes for a short period when the protective system broke down, and completely unsettled the birds for a time. Similarly, the persistent harrying of the Black-headed Gull colonies for food in the war years led to the foundation of several new colonies in counties where breeding had never been previously recorded.

With regard to the nesting of the Hobby in Foxley Wood in 1881, it is quite clear from Norgate's paper that only one of the three nests

reported by him could have belonged to this species. Norgate was no mean field-worker in his younger days, but at that period very little was known in England of the breeding-habits and eggs of the Hobby, and his preconceived ideas on the subject were quite erroneous. Moreover, out of the numerous eggs ascribed to the Hobby in his collection, I have only seen one clutch which could be said to be undoubtedly authentic.

While it is possible that the Hen-Harrier formerly bred in Norfolk, it should be remembered that this species is more a bird of the wolds and moorlands than of the marshes, and there is much confusion between the three species in all older records.

Perhaps it is worth noting that the egg of the Honey-Buzzard from the Crewe collection, said to have been taken near Thetford in 1889, was crudely blown with a ragged hole, and therefore very unlikely to be a continental specimen.

As might be expected, the subject of migration is much more fully treated than in most county faunas and contains much interesting and significant matter. There is a good map of the county, but for faunal purposes we think that the altitudes should be indicated in colour, as in the maps attached to the *History of the Birds of Kent, Dumfriesshire and Essex*.

The Bibliography only contains the more important faunal papers, but the period for 1918 to the present time has been treated rather more fully. There is a delightful frontispiece and the photographs are exactly what are needed in a work of this kind. The book is one which we can heartily recommend to all bird-lovers.

F. C. R. JOURDAIN.

LOCAL REPORTS AND TRANSACTIONS.

Transactions of the Norfolk and Norwich Naturalists' Society for 1928-29.

THE Presidential Address by Mr. H. F. Witherby entitled "A Guide to some Ornithological Work" discusses subjects for observation and study, both by individuals and by groups of observers, and makes many suggestions from which observers may choose a subject in which to specialize. Mr. N. F. Ticehurst continues his account of Norfolk Swan-marks, dealing in the present paper with those of "Fenland". In a Report of the Blakeney Point Research Station, Professor Oliver remarks that the policy at Blakeney Point is to protect the Terns by destroying ground vermin, Crows, Black-headed Gulls and Little Owls, all of which have been found to be destructive. At Scolt Head Island an opposite policy is pursued, all birds being welcome excepting Gulls. The "Far Point" at Blakeney, which had arisen sufficiently by 1919 for a few Terns to nest on it, has developed so rapidly that now practically all the birds nest there. Interesting experiments are being made by Professor Oliver as to the effect upon the plants in this new area by the enriching of the soil by the large colony of Terns. This part also includes a paper by Mr. E. C. Stuart Baker on "Oology as an Aid to Science", the usual yearly Report on Wild Bird Protection and additions to the birds of Norfolk, 1924 to 1928.

Report on Somerset Birds, 1929. By Rev. F. L. Blathwayt, assisted by B. W. Tucker.

In the Introduction to this Report we are told that candidates for membership of the Somerset Natural History Society have now to

make a declaration on the question of Protection Orders. It seems to us a grave mistake thus to involve a Society, which exists for the advancement of science, in decisions which may have no scientific basis at all. The main Report contains a number of interesting items, among which we may mention the following: a Chough appeared but did not stay at Porlock Weir early in 1929; a Pipit seen on November 6th on Porlock Marsh may have been a Tawny Pipit, but the evidence is not conclusive; the Nightingale is recorded as nesting slightly further west than previously recorded; an Eagle, identified as a Golden Eagle by Mr. G. F. Luttrell, who had often seen Golden Eagles in Scotland, was seen at close quarters on February 16th and 18th near Dunster; a flock of twenty Black-tailed Godwits was reported at Berrow on September 8th, 1927; several Quail were reported as nesting. Special attention has been devoted to the Ducks, and the notes under these are fuller and in a separate section, the status of each species has been summarized under districts and past records with references are given. This section is thus very valuable for permanent reference. Attention may also be drawn to some notes at the end of the Report on the effects of the severe weather in February, 1929.

Report on the Birds of Wiltshire for 1929. By M. W. Willson.
(Reprinted from *Wilts. Archæol. and Nat. Hist. Mag.*, Vol. XLV., pp. 24-35.)

WE congratulate Mr. Willson on having revived a Report on the birds of Wiltshire. For this purpose he has got together a band of observers (whose numbers we hope will increase) in different parts of the county and here gives their observations briefly under species headings. This being the first year for some time that such a report has been made some of the observations refer to previous years. The effect of the severe frost in February, 1929, on the Long-tailed and Marsh-Tit, Goldcrest and Creeper seems to have been particularly severe, while many Redwings were also killed. Of unusual occurrences we may mention Golden Orioles in 1916, 1925 or 6, and 1928; Waxwing 1913-14 and 1926; Peregrines still, we are glad to know, nesting on Salisbury Cathedral; the Tufted Duck nesting at Wilton Water in 1926 has already been recorded in our pages (*antea*, Vol. XX., p. 108) and two pairs were seen there in 1928 and 1929; Sandwich Tern, August, 1922, and Black Tern, August, 1928. The absence of records of some species is quite rightly remarked on. We hope that Mr. Willson and his band of helpers will continue their good work.

Report of the Marlborough College Natural History Society for 1929.

ALTHOUGH Wiltshire as a whole has had no regular ornithological report for some years prior to the one above noticed, this excellent school society continues year after year to print a report on the local birds. This is now arranged in a much abbreviated form, and the more important observations have been incorporated in Mr. Willson's report for Wiltshire. On page 106 Mr. A. L. W. Mayo gives a fuller account than he has already in our pages (*antea*, Vol. XXIII., p. 128) of the remarkable case of two female Red-backed Shrikes laying ten infertile eggs in the same nest with apparently no cock bird. On pages 97-99 Mr. W. D. Shaw contributes a short historical account of the Savernake Forest Heronry.

The London Naturalist for the Year 1929.

THE chief item in this excellent yearly publication of the London Natural History Society is the Address of the President, Mr. W. E. Glegg, who took as his subject "The Birds of Middlesex since 1866." The latter date is that of the publication of the late J. E. Harting's book, *The Birds of Middlesex*, and Mr. Glegg has searched a mass of literature from that date and here gives the result. In his introductory remarks the author discusses briefly the changes which have had such an important bearing on the county's bird-life, giving us a glimpse of ancient history when Kites and Spoonbills bred in London, and bringing us up to the present day by tracing some of the striking differences in the birds. A briefly annotated list of 233 species follows. This list, which Mr. Glegg calls a skeleton, should in itself prove of great use and it is hoped that it will stimulate those who live in Middlesex to contribute information to Mr. Glegg, who intends to write a new ornithology of the county. A very good medium for the collection of such records is the *London Naturalist* itself, and in the present issue we find a number of interesting observations on the birds of the wide area covered by the Society, these being now arranged, we are glad to see, under counties. Mr. D. Lack contributes to this number an article on the Nightjar, of which he has made a special study, and many of his observations, being the result of careful and prolonged watching, are of great value.

Report of the Oxford Ornithological Society on the Birds of Oxfordshire, Berkshire and Buckinghamshire. 1928 and 1929. Edited by B. W. Tucker.

BOTH these reports are very well drawn up and contain much valuable matter, especially that for 1928, which we regret to have omitted to notice before. Some good co-operative work was done at Oxford at the trapping station for ringing, in connexion with Starling roosts, on the distribution of the Corn-Bunting and its possible relation to geological formation, as well as the large work of the Rook Census, which has already been noticed in our pages.

In 1928 a pair of Shoveler bred on Otmoor—a first record for Oxfordshire—while the Quail nested in the county both in 1928 and 1929. It is also stated that a pair of Golden Orioles bred for several seasons many years ago near Haseley and, though details cannot be given, the evidence is said to be reliable.

Of other noteworthy occurrences we may mention the following: A Blue-headed Wagtail on Otmoor on May 7th, 1928; a Dipper at Medley Weir on March 23rd, 1929; a flock of twenty to thirty Bee-Eaters reported to have been seen from a car between Oxford and Northampton in the evening of September 4th, 1929, could scarcely have escaped detection elsewhere if correct; a White-tailed Eagle seen at Sidown, Hants., on December 18th, 1927, was observed later about Combe, Berks.; a White Stork was seen on Otmoor on May 5th, 1928; a Purple Heron was shot near Aynho, Northamptonshire, on May 29th, 1928, and a Little Bittern was watched at close quarters near the Windrush on May 24th, 1928; a Bittern was seen at Weston Turville Reservoir several times in 1928 from January 15th to March 13th, on which date and up to May 4th it was heard booming frequently, and it is thought that the same bird visited the Tring Reservoirs on occasions; a Black-throated Diver frequented the river at Oxford

during the cold spell in February, 1929, and a Blackcock appeared in a garden in Oxford on March 19th, 1928, but this last may have escaped from confinement.

The Eton College Natural History Society. First Annual Report, 1929-30.

ETON is to be congratulated on making such an excellent start with its Natural History Society as this Report shows. We are glad to see that a good many members are keen on birds, and they contribute an interesting series of observations made in the district. Amongst these we note that some members visited the Siskin's nest at Taplow which was reported in our pages (Vol. XXIII., pp. 59 and 60) and the statement is made here that the birds built a second nest in a fir tree. This is interesting, as the first nest was in a rose pergola—an abnormal site. On page 36 it is stated that five Snow-Buntings, a bird very rarely recorded from Middlesex, were seen at Staines on November 20th, 1929.

Cardiff Naturalists' Society, Report and Transactions, Vol. LXI., 1928.

THIS Report, published in 1930, contains a valuable historical article on the Kite in south Wales by Dr. J. H. Salter. From the information here given the status of the bird in recent years may be briefly summarized as follows: There were considered to be twelve pairs of adults in 1920. In that year there was much felling of oak and woodmen and young men recently demobilized proved destructive. Four adult Kites are known to have been killed. In 1929 six pairs were under observation (four pairs bringing off young) while it was thought that there were two or three other pairs, which were not located. Some of the reasons given for the present non-success of the Kites are occasional destruction due to local human jealousies; harrassing of the Kite by Carrion-Crows, from whose attacks it appears to be unable to defend its eggs or young, and by Buzzards, which have become very numerous; easy desertion of the nest and a number of eggs being infertile. This Report also contains Ornithological Notes for 1927-8 compiled by Messrs. Ingram and Salmon. Amongst these we may particularly note the appearance of a pair of Gadwall on Lisvane Reservoir in November, 1927.

Notes on Local Birds, 1921-1927. By Hugh S. Gladstone. (Reprinted from *Trans. Dumfries. & Galloway N.H. & Antiq. Soc.*, October 21st, 1927.)

THIS is a second instalment of additions and corrections to his *Birds of Dumfriesshire* by Mr. Gladstone. Amongst the many items brought forward we may note the following: A Wren's nest built into the base of a Song-Thrush's, both broods being hatched. A reference to a catalogue of sale in 1861 in which were described four eggs of a Crested Tit supposed to have been taken in Dumfriesshire. This Mr. Gladstone thinks may have been in the late Harvie-Brown's mind when he referred to an alleged occurrence of the species in the county. The Great Spotted Woodpecker has become firmly established, but we regret to hear that the Black Grouse is still decreasing seriously in the county. In discussing some examples of hen Pheasants assuming the plumage of the cock, Mr. Gladstone states as his opinion from personal observation that about 1 in 740 is the average of this abnormality. Mr. Gladstone concludes his paper with a list of recoveries of ringed birds affecting the county.

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THE "BRITISH BIRDS" MARKING SCHEME.*

PROGRESS FOR 1930.

BY

H. F. WITHERBY.

THE number of birds ringed in 1930 is over three thousand more than our previous best total, as will be seen by the table below. The increase in the numbers in recent years has been remarkable, and it may be noted that the rings used in the last six years account for almost half our total for twenty-two years.

NUMBER OF BIRDS RINGED.

In 1930			28,610		
In 1909	...	2,171	In 1919	...	3,578
,, 1910	...	7,910	,, 1920	...	5,276
,, 1911	...	10,416	,, 1921	...	8,997
,, 1912	...	11,483	,, 1922	...	9,289
,, 1913	...	14,843	,, 1923	...	12,866
,, 1914	...	13,024	,, 1924	...	18,189
,, 1915	...	7,767	,, 1925	...	18,233
,, 1916	...	7,107	,, 1926	...	23,432
,, 1917	...	6,926	,, 1927	...	21,625
,, 1918	...	5,937	,, 1928	...	24,479
			,, 1929	...	25,243
Grand Total ...			287,401		

The band of ringers who have contributed to this excellent result is now very large. Owing to the fact that in many cases a number of people assisting in the ringing are grouped under one name, it is impossible to state how many actual ringers there are, but they must total over two hundred. In 1930 Dr. Moon has reached the astounding total of five

* For previous Reports see Vol. III., pp. 179-182, for 1909; Vol. IV., pp. 204-207, for 1910; Vol. V., pp. 158-162, for 1911; Vol. VI., pp. 177-183, for 1912; Vol. VII., pp. 190-195, for 1913; Vol. VIII., pp. 161-168, for 1914; Vol. IX., pp. 222-229, for 1915; Vol. X., pp. 150-156, for 1916; Vol. XI., pp. 272-276, for 1917; Vol. XII., pp. 96-100, for 1918; Vol. XIII., pp. 237-240, for 1919; Vol. XIV., pp. 203-207, for 1920; Vol. XV., pp. 232-238, for 1921; Vol. XVI., pp. 277-281, for 1922; Vol. XVII., pp. 231-235, for 1923; Vol. XVIII., pp. 260-265, for 1924; Vol. XIX., pp. 275-280, for 1925; Vol. XX., pp. 236-241, for 1926; Vol. XXI., pp. 212-219 for 1927; Vol. XXII., pp. 253-258 for 1928; Vol. XXIII., pp. 258-263, for 1929.

thousand three hundred and thirty-four, which far exceeds anything which he himself or anyone else has done before. In this enormous total there are fifty species represented. In eleven of these more than a hundred individuals have been ringed, the larger numbers being: Lapwing (1,183), Song-Thrush (750), Blackbird (630), Starling (443), Pied Wagtail (236). In addition to these, Dr. Moon's list contains large numbers of two species which I singled out in my last Report as being unremunerative, viz., Sand-Martin (363) and Willow-Warbler (302)! After Dr. Moon's huge total others seem small, but in reality those of Mr. Boyd and Lord Scone of over two thousand, and that of Mr. Robinson of just under two thousand, are very large. Mr. Boyd has ringed fifty-two species, of which the chief are a very large number of Swallow (533), Sandwich Tern (340), Starling (219), while Tree-Sparrow (108) and Mallard (104) are specially noticeable. Lord Scone has forty-seven species, and nearly half his total is made up of non-Passerine birds, amongst which we note a remarkable number of Woodcock (244), Mallard (133), Wood-Pigeon (72), Land-Rail (50), Eider (27). Mr. Robinson's total is made up of large numbers of a few species, viz., Common Tern (613), Sandwich Tern (522), Puffin (420, all adults), Lesser Black-backed Gull (236). Mr. Morshead, who comes next with just under one thousand, has devoted himself mainly to the Passeres, while Mr. Garnett's total of over eight hundred includes forty-five species, the largest being Sandwich Tern (349). The Messrs. Harrison have ringed 230 Herring-Gulls, Mr. R. G. Williams 189 Linnets, Col. Pollitt 103 Mallard, 60 Cormorants, and 41 Herons. Amongst other unusual species to be ringed in number I note 120 Razorbills ringed by Mr. E. Cohen and 40 by Mr. T. Kerr; 16 Sparrow-Hawks, 8 Buzzards and 5 Peregrines by Mr. R. H. Brown; 41 Wood-Pigeons by Mr. J. Bartholomew; 44 Rooks by the Oxford Ornithological Society, and 42, as well as 39 Jackdaws, by St. Edmund's School; 40 Gannets and 40 Kittiwakes by Mrs. Hodgkin; 260 Manx Shearwaters by Mr. B. B. Roberts and 50 by Mr. R. M. Lockley; 33 Ring-Ouzels by Mr. T. K. Craven and 31 Swifts by Mr. P. K. Chance.

Trapping and retrapping has, I am glad to say, increased, and more ringers are evidently adopting this useful method, which is certain to lead to important results if carried on regularly. We know by the returns that Mr. A. W. Boyd, Dr. J. N. D. Smith and Mr. P. E. A. Morshead, among others, have worked traps with excellent results, and Lord Scone

informs me that he has done a great deal this year, having trapped and ringed, for instance, 170 adult Starlings and 118 Blackbirds, while others have made a good beginning in this branch. Much more, however, should be done, and it would be a great advantage to results if more time were spent on trapping adults or young birds out of the nest rather than ringing nestlings of the small, unremunerative species.

In this connexion Mr. W. B. Alexander is carrying out tests at Oxford of several types of moveable traps, and he is anxious to secure information from trappers as to the types of traps they are using and the results obtained. All communications on the subject will be welcome, and should be addressed to him at the University Museum, Oxford. Mr. Alexander has kindly agreed to report his findings to *British Birds* later and we then hope to be able to make arrangements with a manufacturer to supply a definitely recommended trapping outfit to ringers at a reasonable cost.

I am glad to see an increase in the numbers of ducks ringed and again impress upon ringers to do their utmost to ring more ducks, especially of those species of which we have up to now ringed very few. The Cuckoo is another species of which more should be sought out and ringed. Hawks also require more attention. The numbers of Herons ringed has dropped, and I hope this bird will be increased next year, while Rooks and Wood-Pigeons are both very necessary to be ringed in larger numbers before we can say definitely whether our breeding birds are subject to movements or not. Except for the Lapwing, we have ringed comparatively few waders, and I am glad to see the number slightly increased this year. I refer specially later on to the great importance of ringing oceanic birds.

Let me once more ask ringers to devote less time to ringing small birds in the nest, to do more trapping and catching of young birds out of the nest and adults, and to ring more of the larger and more difficult birds to find and get at. As the mortality of young small birds in the nest and just out of the nest is undoubtedly very heavy, if we ring fewer of these and more "grown up" birds and larger species, we shall have more effective and valuable results. I am afraid that my remarks last year on the subject of what *not* to ring have fallen on certain deaf ears, as the totals this year of these birds have scarcely diminished, and in some cases have increased. This, I feel, is a waste of energy for all concerned, and, apart from the time occupied by the ringers themselves,

I must point out that the office organization involved in dealing with the present very large numbers of rings and schedules has become a serious matter and that this can only be carried on if results are really adequate and make the great labour involved worth the while.

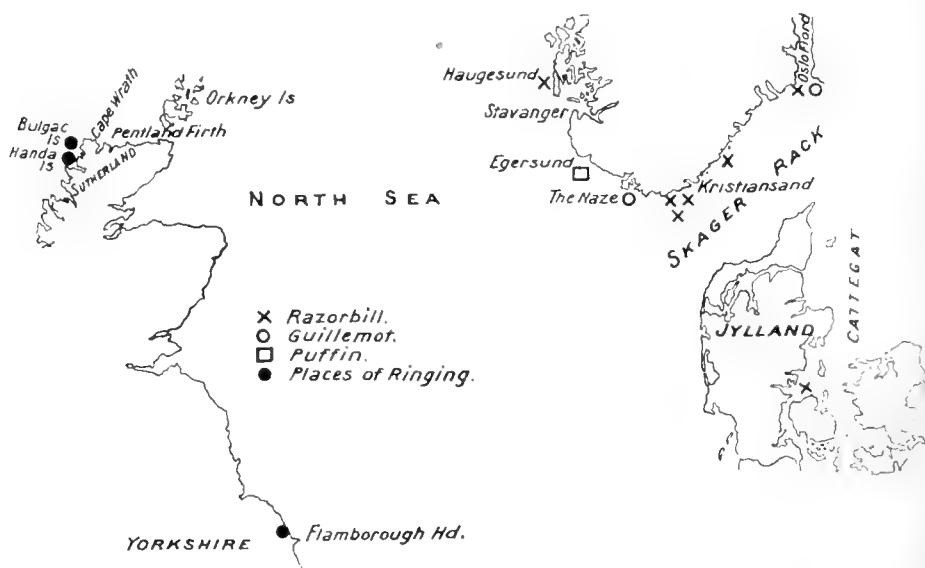
I must therefore appeal to ringers *not* to ring *nestlings* of the following species unless for some special purpose: *Sky-Lark*, *Tree-Pipit*, *Tits*, *Goldcrest*, *Spotted Flycatcher*, *Willow-Warbler*, *Whitethroat*, *Wren* and *Sand-Martin*. I also consider that much less attention than heretofore should be paid to the following *nestlings*, of which we have already ringed large numbers, unless this is being done for some special purpose, such as retrapping, viz., *Greenfinch*, *Chaffinch*, *Robin*, *Hedge-Sparrow*. I must again impress upon ringers that our first aim must be more adequate results, which can only be arrived at by ringing more of the "remunerative" species and more "grown up" birds.

This leads me to a consideration of the recoveries during the year, amongst which there have been a number of exceptional interest. The notes by Mr. Thomas and Mr. Boyd (*antea*, pp. 127 and 160) on their results of catching of Swallows (*Hirundo r. rustica*) year after year are of considerable importance and enquiries on these lines should be developed and extended to other species. Mr. Lockley's results (*antea*, pp. 204-6) with adult Shearwaters (*Puffinus p. puffinus*) are equally important, and similar experiments should be carried out with other sea-birds which can be caught on their nests.

Besides the quickly accumulating evidence with regard to the habits of "sedentary" birds, trapping has resulted in some interesting records of the origin of winter visitors, such as a Blackbird (*Turdus m. merula*), ringed in December in Dumfriesshire by the Messrs. Duncan, being found in Norway in April, and Starlings (*Sturnus v. vulgaris*) ringed in various parts of England in winter returning to Belgium, Holland, Germany and east Prussia. Trapping was also responsible for a very interesting batch of records of Mallards (*Anas p. platyrhyncha*) ringed at Hickling, Norfolk, by Mr. Vincent for Mr. Boyd, some of them being recovered at home and others in Denmark, Sweden and Germany (*antea*, p. 187). Other interesting returns of ducks have been a Sheld-duck (*Tadorna tadorna*) ringed as adult in April in Fifeshire by Lord Scone and reported from the River Elbe in September, a Wigeon (*Anas penelope*) ringed as young also by Lord Scone at Loch Leven and reported from Loire Inférieure in

October, and a Teal (*Anas c. crecca*) ringed by Sir R. Graham in Cumberland migrating to Germany.

The group of recoveries of Razorbills (*Alca torda*) ringed by Mr. E. Cohen on Handa, Sutherland (cf. *antea*, p. 217), is of exceptional interest, because we know very little about the movements of these oceanic birds and because these records, being five in number and fitting in with isolated previous records, point to a regular and not accidental movement. It will be noted that all these birds, having turned Cape Wrath, proceeded eastwards, and four had reached the Skager Rak by the middle of October, while one was reported south of the Kattegat at the beginning of November. Of previous records we have two other Razorbills, ringed when



nestlings off N.W. Sutherland, proceeding in the same year as ringed, one to a little north of Stavanger by September 21st and the other to Oslo Fiord by the middle of October. In addition to these seven records of Razorbills we have a Puffin (*Fratercula a. grabæ*) ringed as a nestling at Handa in 1927 recovered off Egersund, S.W. Norway, on October 22nd of the same year; a Northern Guillemot (*Uria a. aalge*) ringed as an adult at Handa and reported from Oslo Fiord two years later on December 31st, as well as a Southern Guillemot (*U. a. albionis*) ringed as a nestling in Yorkshire and recovered on October 22nd of the same year in the extreme south-west of Norway. The fact that nine of these birds proceeded from their birthplace on the shores of the Atlantic into the North Sea, indicates a migration in an unlooked for direction, and possibly an investigation into

the food-supply would reveal the controlling factor in this case. These recoveries are of extreme interest and afford a clear demonstration of the value by accumulation of isolated records.

Two other exceptionally interesting recoveries, supporting previous ones, have been reported since the publication of our last list. One of these is also of an oceanic species—the Kittiwake Gull (*Rissa t. tridactyla*) and throws a little light on the migrations of this bird, though they are still certainly obscure. This Kittiwake (ring No. 69331) has been reported to me by Mr. Gower Rabbitts of the Game and Fisheries Board, Newfoundland, but at present date and locality are not to hand. The bird was ringed in the Farne Islands, Northumberland, by Mrs. Hodgkin, in June, 1928, and is the third so ringed which has taken the same direction (*cf.* Vol. XX., pp. 203-4). Thus

<i>Ringed.</i>			<i>Reported.</i>		
Farne Is.,	nestling,	28.6.23, by	St. Barbe,	Newfoundland,	12.8.24,
	A. C. Greg.			L. Curtis.	
Ditto	30.6.24,	by Mrs.	Hamilton	Inlet,	Labrador,
	Hodgkin.			28.10.25, by	G. Budgett.
Ditto	23.6.28	ditto	Newfoundland,	? 1930, by	Gower Rabbitts

I hope to return to this subject when full details of the third recovery arrive, and there is news of another of our ringed birds in Newfoundland, which may prove to be a fourth Kittiwake. Meanwhile, it may be said that these three records occurring in different years give evidence of some regular migration and are not mere chance wanderings.

Mr. E. M. Nicholson's observations (see Vol. XXII., pp. 127-8) have shown that Kittiwakes occur right across the Atlantic between here and Greenland, that they are not inconvenienced by heavy weather and that they are not in any way dependent on following ships. The fact that a Kittiwake ringed in Greenland has migrated in the opposite direction and has been found in Europe is puzzling, but most of our ideas of migration are based on observations of birds which depend on land, or the near proximity of land, for food and rest, and in studying the migrations of oceanic birds, which normally only go to the land for breeding, we must always bear in mind that the ocean is the home and feeding-ground of these birds, and that the factors controlling their movements may be entirely different to those which operate on birds dependent upon land. It seems to me that a more intensive study of the distribution and movements

of oceanic birds is of great importance and may even lead to new ideas concerning what are still unsolved problems in migration. There are two obvious ways in which our knowledge can be increased: (1) by ringing more Kittiwakes and "Auks" both here and in North America, and (2) by making series of exact day to day observations at sea as those described by Mr. Nicholson.

The other unpublished recovery, confirming a previous one, is that of a Wood-Warbler (*Phylloscopus s. sibilatrix*) which has been reported as having been recovered in October, 1930, in the province of Avellino, south Italy. This bird was ringed No. J.9712 as a nestling on June 17th, 1930, in Radnorshire, by Mr. P. A. D. Hollom for the London Natural History Society. It is only the second Wood-Warbler ringed under our scheme and recovered abroad, the previous one ringed in Buckinghamshire in 1924 having been recovered at Potenza, within fifty miles of the present record. Mr. B. W. Tucker, who has made a special study of the birds of the Naples district, informs me that the Wood-Warbler is not known to winter in Italy, though it might conceivably do so in the extreme south, but not in the Avellino province, which is mountainous. Failing any definite record we must conclude that these birds were proceeding to Africa, and this second record shows that the route is not abnormal. As the large majority of our migrants no doubt make their way south *via* western France and the Spanish Peninsula, this exceptional route by the Wood-Warbler is remarkable, and as the bird is found in west Africa in winter it is difficult to suggest any reason for it.

Among a number of other interesting recoveries the following may be briefly noticed: The Cuckoo reported from west Africa and already discussed (*antea*, p. 77). A Montagu's Harrier ringed at Hickling and reported from Cantal, France. Sandwich Terns ringed in Norfolk and reported from France (2), south Portugal (1), west Africa (1), and south Africa (1), one ringed in Lancashire also reported in west Africa, and two which have travelled north in their first year, viz., Northumberland to Banff and Norfolk to Germany. Previous records suggest that it is not unusual for these birds to go north in August and September, before, we may assume, they take their long journey south. A Land-Rail from Perth to central France has already been recorded, and another ringed for Lord Scone in Kirkcudbrightshire in June, 1929, and recovered in Calvados, France,

in September of the same year has not yet been published. Other notable records are first year Song-Thrushes from Perth to S.W. France and Suffolk to Belgium, a Meadow-Pipit and a Linnet to S.W. France and a Sand-Martin and Oystercatcher to western France.

A Swift and a Tawny Owl ringed eight years previously were reported from the place of ringing, while a Black-headed Gull of twenty years was referred to on page 55 of this volume with other long-ringed birds.

I regret to find that in my last annual report a considerable error was made in the number of Song-Thrushes recovered, while several other errors occurred in the percentage column.

I take this opportunity of reminding ringers that it would be most helpful if they would accompany their schedules with a list of birds ringed. The birds should be arranged in the order of the list printed in this Report. The task of collating the figures to make up the total ringed of each species is very considerable, and careful lists in correct order would be a great assistance.

I desire here to record my grateful thanks to Miss E. P. Leach, who has recently most kindly undertaken to deal with reports of recoveries. To obtain full and accurate details of each recovery and record them on the cards and in the published lists requires great care and a considerable knowledge of birds, besides involving an amount of work which would surprise anyone who had no experience of it, and all interested in the scheme are much indebted to Miss Leach for undertaking this important section.

NUMBER OF BIRDS "RINGED."

DR. H. J. MOON (5334), Mr. A. W. Boyd (2295), Lord Scone (2003), Messrs. H. W. Robinson (1904), P. E. A. Morshead (962), R. M. Garnett (854), T. H. and W. R. D. Harrisson (719), R. G. Williams (711), Lt.-Col. G. P. Pollitt (692), Messrs. G. B. Blaker (655), E. Cohen (642), R. H. Brown (621), Lon. Nat. Hist. Soc. (601), Mr. J. Bartholomew (495), Perths. Nat. Hist. Soc. (463), Miss F. K. Staunton and N. T. Walford (438), Ox. Orn. Soc. (379), Mr. M. L. Pilkington (371), St. Edmund's School Nat. Hist. Soc. (359), Mrs. T. E. Hodgkin (340), Mrs. G. Wilson (332), Messrs. E. F. Wood (315), A. Mayall (303), J. F. Thomas (275), B. B. Roberts (269), W. A. Cadman (263), W. J. Eggeling (259), Miss E. C. Sharp (254), Mr. T. Kerr (245), Clifton College Scientific Soc. (224), Messrs. G. Brown (203), J. M. Fletcher (202), T. L. Smith (202), F. K. Craven (189), Dr. J. N. D. Smith (179), Major W. M. Congreve (160), Messrs. F. J. L. Mitchell (144), E. O. Lester (142), C. F. Archibald (127), D. J. Robertson (122), W. D. Shaw (117), J. M. Hepburn (114), Rev. E. U. Savage (114), Messrs. F. A. Craine (112), C. R. Stonor (112), R. Carlyon Britton (109), R. Howarth (108), J. Cunningham (106),

M. Portal (102), Sir Stephen Bilsland (98), Messrs. R. O. Blyth (92), H. Whistler (90), Mrs. A. Mackenzie (87), Messrs. P. K. Chance (83), H. C. R. Gillman (80), H. F. Witherby (79), H. S. and A. Greg (69), T. R. Tallis (69), E. G. Holt (65), J. D'eath (63), J. M. Fisher (63), Rev. E. Peake (59), Miss E. W. Higginbotham (57), Messrs. R. M. Lockley (54), V. C. Wynne Edwards (53), Sir A. Wood (50), Messrs. H. V. Bamford (49), R. Martinson (48), Miss M. H. Greg (47), Messrs. J. R. B. Masefield (47), R. Broke (43), A. G. Haworth (42), F. S. Chapman (37), Miss J. M. Ferrier (36), Mr. W. P. G. and Mrs. L. E. Taylor (36), Westonbirt School (36), Messrs. T. Perrin (35), W. King (34), E. P. Chance (31), J. C. Corner (31), S. P. Oliver (30), Dr. T. H. B. Bedford (27), Sir R. J. Graham (27), Mr. G. F. M. Swiny (27), Col. H. W. Madoc (26), Miss R. Bickersteth (24), Mrs. Rait Kerr (24), Messrs. A. Morrison (23), J. S. Elliott (22), F. J. Burlinson (21), R. J. Buxton (21), Mrs. J. F. Evetts (21), Mr. H. S. Gladstone (20), and a number of others who have ringed less than twenty each.

	NUMBERS OF EACH SPECIES "RINGED."					RECOVERED.	
	'09-'27	'28	'29	'30	Total	of those ringed 1909-29	Per- centage
Raven ...	31	6	6	21	64	5	11.6
*Crow, Carrion ...	250	32	78	35	395	18	5.0
Rook ...	986	212	274	175	1647	45	3.0
Jackdaw ...	756	124	162	159	1201	41	3.9
*Magpie ...	152	26	47	67	292	9	4.0
Jay ...	154	28	23	43	248	10	4.8
Starling...	13683	1579	2441	2040	19743	772	4.3
Greenfinch ...	6463	710	904	737	8814	190	2.3
*Goldfinch ...	83	20	15	30	148	2	1.6
Twite ...	68	4	2	—	74	—	—
Redpoll, Lesser	242	13	3	11	269	2	0.7
Linnet ...	4423	304	212	459	5398	33	0.6
Bullfinch ...	622	30	62	42	756	7	0.9
Chaffinch ...	8039	858	671	887	10455	173	1.8
Brambling ...	20	6	18	—	44	—	—
Sparrow, Tree ...	597	111	152	113	973	12	1.3
Bunting, Yellow	1695	183	221	290	2389	99	4.7
Bunting, Reed...	732	121	44	106	1003	13	1.4
Lark, Sky ...	2383	102	142	156	2783	27	1.0
Pipit, Tree ...	784	200	82	112	1178	3	0.2
Pipit, Meadow ...	1954	120	184	266	2524	28	1.2
Wagtail, Yellow	302	33	59	53	447	—	—
Wagtail, Grey ...	364	49	35	37	485	1	0.2
Wagtail, Pied ...	2005	333	232	425	2995	44	1.7
Shrike, R.-backed	446	46	66	43	601	—	—
Flycatcher, S. ...	2075	259	196	177	2707	6	0.2
*Flycatcher, Pied	339	47	23	24	433	2	0.4
Chiffchaff ...	390	60	44	54	548	2	0.4
Warbler, Willow	5243	1165	816	582	7806	33	0.4
Warbler, Wood	718	95	34	3	850	1	0.1
Warbler, Reed...	446	66	78	133	723	4	0.6
Warbler, Sedge	598	49	31	84	762	1	0.1
Warbler, Garden	580	44	36	56	716	1	0.1
Blackcap ...	347	31	40	36	454	—	—
Whitethroat ...	2186	169	251	214	2820	13	0.4
Whitethroat, L.	324	8	32	13	377	—	—
Thrush, Mistle	1622	234	174	157	2187	30	1.4
Thrush, Song ...	25904	3265	2354	2644	34167	405	1.2
Redwing ...	47	1	12	1	61	—	—
Ouzel, Ring ...	265	22	15	39	341	3	0.9
Blackbird ...	17423	2391	2185	2665	24664	556	2.5
Wheatear ...	945	44	107	56	1152	24	2.1
Whinchat ...	913	93	109	112	1227	7	0.6
Stonechat ...	400	43	26	32	501	3	0.6
Redstart ...	967	91	90	40	1188	4	0.3
Nightingale ...	242	37	38	18	335	2	0.6
Redbreast ...	8073	956	718	874	10621	445	4.5
Sparrow, Hedge	4850	538	538	699	6625	232	3.9
Wren ...	2632	226	137	135	3130	8	0.2
Dipper ...	431	100	57	47	635	5	0.8
Swallow ...	14623	1802	2144	1982	20551	126	0.6
Martin ...	5781	647	986	517	7931	46	0.6
Martin, Sand ...	2560	195	524	622	3901	8	0.2
*Swift ...	396	32	71	73	572	34	6.8
Nightjar ...	96	6	6	15	123	—	—

NUMBERS OF EACH SPECIES "RINGED."						RECOVERED	
	'09-'27	'28	'29	'30	Total	of those ringed 1909-29	Per- centage
Kingfisher ...	67	14	10	12	103	4	4.3
Wryneck ...	303	10	16	—	329	6	1.8
Cuckoo ...	287	32	27	26	372	12	3.4
*Owl, Little ...	164	39	25	31	259	18	7.8
Owl, Long-eared ...	84	11	18	6	119	4	3.5
Owl, Barn ...	159	13	15	32	219	16	8.5
Owl, Tawny ...	320	53	29	63	465	29	7.2
Peregrine Falcon ...	7	10	5	8	30	7	31.8
*Merlin ...	96	23	5	4	128	26	20.9
Kestrel ...	326	49	40	44	459	46	11.0
*Buzzard ...	55	27	13	15	110	6	6.3
Hawk, Sparrow ...	182	23	40	23	268	39	15.9
Heron, Common ...	306	346	163	128	943	81	9.9
Sheld-Duck ...	87	17	16	37	157	8	6.6
Mallard ...	2397	311	282	468	3458	542	18.1
Teal ...	784	26	18	28	856	94	11.3
Wigeon ...	136	13	1	10	160	14	9.3
Duck, Tufted ...	70	—	—	—	70	9	12.8
Eider ...	62	7	19	55	143	2	2.2
Cormorant ...	596	38	187	64	885	146	17.7
Shag ...	594	74	161	53	882	99	11.9
Gannet ...	968	97	—	40	1105	39	3.6
Shearwater, Manx ...	131	5	160	326	622	10	3.3
Wood-Pigeon ...	1067	142	132	227	1568	61	4.5
Dove, Stock ...	191	38	13	22	264	5	2.0
Dove, Turtle ...	310	23	34	19	386	31	8.4
Stone-Curlew ...	39	18	3	18	78	3	5.0
Oystercatcher ...	387	45	43	82	557	19	4.0
Plover, Ringed ...	419	42	28	88	577	6	1.2
Plover, Golden ...	81	3	24	20	128	1	0.9
Lapwing ...	9286	1827	2183	2628	15924	324	2.4
Sandpiper, C. ...	465	17	44	29	555	2	0.3
Redshank ...	661	94	87	146	988	39	4.6
Curlew, Common ...	786	132	193	145	1256	47	4.2
Snipe, Common ...	569	95	65	87	816	50	6.8
Woodcock ...	1260	421	313	305	2299	134	6.7
Tern, Sandwich ...	1908	800	765	1371	4844	32	0.9
Tern, Common ...	6916	75	696	1028	8715	123	1.6
Tern, Arctic ...	209	29	84	74	396	1	0.3
Tern, Little ...	257	16	5	21	299	2	0.7
Gull, B.-headed ...	12034	23	20	80	12157	534	4.4
Gull, Common ...	725	75	101	62	963	22	2.4
Gull, Herring- ...	921	220	237	453	1831	28	2.0
Gull, L. Blk.-bkd. ...	5091	150	232	381	5854	197	3.5
Gull, G. Blk.-bkd. ...	199	3	19	30	251	4	1.8
Kittiwake ...	258	30	38	69	395	3	0.9
Razorbill ...	323	10	1	208	542	7	2.0
*Guillemot ...	980	1	—	51	1032	16	1.6
Puffin ...	1082	447	131	464	2124	5	0.3
Rail, Land ...	38	31	30	53	152	2	2.0
Moor-Hen ...	629	72	71	130	902	14	1.8
Coot ...	47	14	4	15	80	4	6.1

* Of species so marked no record was kept of the number ringed from 1913 to 1920.

SOME BREEDING-HABITS OF THE STORM-PETREL.

BY

SETON GORDON.

THE Storm-Petrel (*Hydrobates pelagicus*) nests on islands which are hard of access, and thus it is difficult to observe closely the period of incubation and the fledging-period of the young.

During the summer and autumn of 1930 I had had under observation a number of Storm-Petrels' nests. A crew of lobster fishers were fishing steadily round the island group where the Petrels nested, and were kind enough to give me a passage whenever I wished to cross to the islands.

The position of the island where these observations were made is in the Hebrides; it lies in latitude $57^{\circ} 35' N.$ and in longitude $6^{\circ} 30' W.$

My first visit was on July 1st. That day, in an old ruined wall, I found a Storm-Petrel (No. 1) brooding on a perfectly fresh egg. On the 15th I found to my disappointment that the Petrel had apparently swept the egg out of the narrow depression in which it had rested, and it now lay at a lower level in the wall, cracked and deserted.

At three o'clock the following morning as I dozed with the lobster fishermen in their small bothy I was awakened by the fluttering of wings on my arm and head and found a Storm-Petrel, apparently dazzled by the candle, moving about my person. Before sunrise, on awakening and opening my eyes the first object they rested on was a Storm-Petrel, its night-flying over, in the act of climbing, moth-like, up the bothy wall and disappearing into its narrow nesting hole. On July 28th I located a second Petrel in the wall. She was in an excellent position for observation (No. 2).

On August 23rd I was interested to see that the Storm-Petrel (No. 1) had laid again and was sitting closely about twelve inches away from the first nesting-place. No. 2, found on July 28th, had now hatched its chick. A third Storm-Petrel was brooding a small chick in another part of the wall, and called sharply and repeatedly when disturbed. In a second wall I found another chick (No. 4) which could be observed through a cranny. On this occasion the chick was unattended, but on crossing to the island two days later the parent bird was in the hollow with the young, and I had an excellent view of both. This chick was about a fortnight old, and I had never before seen a chick of this age attended

by its parent in day-time. On this day I removed the egg from under No. 1 and examined it, afterwards replacing it beneath the bird. The egg was hard set. On the evening of September 4th my wife and I camped beside the Storm-Petrels' wall, as we were anxious to see when the parents came in from the ocean. It was a very warm, dark, evening. From 9.15 p.m. (B.S.T.) to midnight there was no sound, nor any sign of life, from the Petrels. Just at midnight, in the deep gloom, we saw the dark form of the first Storm-Petrel. With swift, swallow-like flight it passed and repassed us, only a few feet away. Presumably the bird had just come in from the sea, for after the young are a few days old the parents usually leave them entirely untended during the daylight hours. For the next half hour nothing was seen, then at 12.30 a second Petrel flew past us. We sat from 9.15 p.m. until 2 a.m. beside the entrance to the hole where a young Petrel (No. 2) was resting in its primitive nest, flashing a small torch into the hole at intervals of ten to fifteen minutes, but all that time the parent bird was never in the hole. I also periodically examined No. 3 on the opposite side of the wall, and never once was the adult bird there. The Storm-Petrel is so fearless at night that I do not think our presence had anything to do with the absence of the birds. It looks as though the young are fed very seldom indeed, and their slow rate of growth would seem to point to a meagre diet. A Storm-Petrel is smaller than a Blackbird. A young Blackbird is fledged in two weeks. It takes the Petrel eight weeks to fledge! All through this night there was complete silence at the nesting colony. This was a great contrast to the noise and excitement we had noticed in another colony in early July (*cf. antea*, Vol. XIII., page 232).

At 9 a.m. on September 5th I again looked at the Storm-Petrel No. 1. There was as yet no sign of the egg hatching.

On September 27th, a beautiful autumn day, I again visited the Petrels. No. 1 nest now contained a lively chick clad in warm grey down and this was, I should say, a fortnight old. The egg from which the chick had hatched was lying beside it, and was not even separated entirely into two pieces. The chick, No. 2, was now well feathered. The wings were long and the white rump was showing clearly. The head was entirely clear of down, but there was down upon the back, and also upon the lower surface of the tail. No. 4 was obviously finding its quarters rather cramped.

As I watched, it stretched laterally one wing, eagle-fashion, to its greatest extent, and I could see that the wing was well-grown, but there was a good deal of down upon the body. After the wing-stretching exercises the youngster made a thorough toilet. It preened the base of the wing-quills, then its shoulders, its breast, its feet, then twice lifted its beautiful, long, pointed wings high above its head, Dunlin-fashion.

My next visit to the Petrels was on October 11th. The day was wild, and about a mile from the island a heavy squall compelled us to reef our sails still further, and forced the Kittiwakes to take refuge on the water's surface. No. 1 chick was now very lively. In its thick, warm, grey down it was impervious to the cold, and felt like a small hot-water bottle. The wing-feathers were growing, but there were no signs of feathers elsewhere. Of the other three chicks (it must be remembered that they were hatched from first layings and so were much more advanced) No. 2 and No. 4 had flown, No. 3 was still in its cranny, but seemed ready to fly at any time.

The winter bird population had begun to arrive at the island. I saw a Purple Sandpiper on the rocks, and as we sailed home beneath a wild sky and in half a gale of wind, a pair of Long-tailed Duck crossed our bows.

On a calm, sunlit day, after a full month of wild weather, I sailed over to the Storm-Petrels' island on October 31st. Barnacle-Geese had arrived in their hundreds at the island. They were very wild, and as they crossed almost overhead their calling sounded most impressive. To-day there was noticeable an astonishing change in No. 1 chick. Three weeks ago to a day it had been a downy chick. Now the wings were well grown, and the white rump was showing. There was a small area of down upon the back. It uttered little chattering cries when I removed it from its hole for inspection. No. 3 had left.

Now ensued some wild weather. On no single day during the week beginning November 10th did the lobster fishermen visit their creels around the island. We endeavoured to make the passage on November 15th, but the seas were heavy, and we were forced to run for harbour. Thus it was not until November 17th that I had an opportunity of seeing how it fared with No. 1 chick which was, I should say, hatched about September 12th. The surrounding hills were white with snow as we sailed across, in the low winter sun, to the

island. Barnacle-Geese were more numerous than ever, and there were Thrushes in numbers around the Petrels' nesting-site. The young Petrel had flown. The strong, characteristic, smell of the species was already faint in the hollow, and I should say that the young Petrel had taken its departure at least a week previously. That would put its first flight at about November 10th.

No more remarkable change of life can be pictured than the young Petrel's first week at sea. For at least eight weeks its world had consisted of a few feet of the interior of the wall, twilight at noon, intensely dark at night. Beyond its vision, and presumably unknown to it, lay the sea. Creeping to the entrance of the nesting-crack in the darkness of a November gale (for storms raged without ceasing from November 7th until November 16th) the youngster must have launched itself out on its perilous first flight, and in a few seconds have been drifted far over the ocean in flying spume and spindrift. Is it possible that it survived the continuous bad weather? After its first flight the Stormy-Petrel apparently never approaches land until the following summer, and thus is compelled to battle day and night with wind and wave.

GREAT CRESTED GREBE ENQUIRY (1931).

BY

T. H. HARRISON, M.B.O.U., AND P. A. D. HOLLLOM.

NEED FOR THE ENQUIRY.

OF late years the Great Crested Grebe (*Podiceps c. cristatus*) has increased to a remarkable extent in Great Britain, and every year it appears to be extending and colonizing new localities, though in some cases old sites have been abandoned.

For this reason it seems to us most important that a full enquiry into the present status and economy of the bird should be made, and that all possible facts relating to its past history and rapidity of increase should now be gathered together and the results published.

PRELIMINARY WORK.

Bearing these points in mind, during 1930 we established a small but complete organization in Surrey, in order to make a detailed study of the Great Crested Grebe in that county. The results obtained in Surrey encouraged us to extend the field of our enquiry, and if possible to carry out investigations on a scale as wide and thorough as that of the *British Birds* Census of Heronries in 1928.

Many observers have, during the last few months, sent us much valuable data for years prior to 1931. The great majority of those who helped us in our preliminary work have offered to do so again in 1931.

APPEAL FOR WIDE SUPPORT.

As a considerable amount of support seems thus assured, we have asked Mr. H. F. Witherby if he will back our enquiry, in order that we may carry out an efficient census for England, Scotland and Wales, with the support of *British Birds*. This Mr. Witherby has very kindly agreed to do, and we believe that with the help of the readers of this magazine it will be possible to organize a census with a considerable degree of completeness for this area. Mr. E. M. Nicholson has promised to advise us on matters of organization, and we shall thus have the full benefit of his experience.

A number of ornithologists and Natural History Societies have already agreed to decentralize large areas. We hope that others will do likewise. We shall particularly require help of this sort from Huntingdonshire, Leicestershire,

Lincolnshire and Northamptonshire and from all parts of Scotland (for which an excellent basis for past history already exists in the paper by the Misses Rintoul and Baxter published in the *Scottish Naturalist*, 1919, pp. 67-77). But help from every county is needed, and observers who can work only one piece of water will be giving very useful assistance. It must also be remembered that negative evidence is necessary and information is required about all waters which do *not* hold Great Crested Grebes.

THE SCHEDULE.

Inserted in this number of *British Birds* is a schedule on which are seven main questions and a number of supplementary points, which are also printed below. Full instructions as to how to use the schedule are printed at its head, but it is desirable to emphasize the following points:—

- (i) While a number of "waters" can be entered on one schedule, provided they are in the same county, a separate schedule must be used for each county. Further schedules will be sent on application to T. H. Harrisson.
- (ii) Care should be taken to ensure that all "waters" entered in column 1 of the schedule may be readily identified on the one-inch ordnance map. Where a "water" has alternative names, or no name at all, the distance and direction from the nearest place traceable on the map should be given.
- (iii) In the absence of accurate data on years of colonization, numbers of breeding pairs, etc., more general remarks will be very useful.
- (iv) No attempt should be made to write answers on the schedule itself regarding the supplementary points. Data on these points may refer to any locality or country, as long as that locality is stated in each case. A separate sheet should be used for each numbered point.

UNDERTAKINGS TO ASSIST.

Also enclosed in this copy of *British Birds* is an addressed postcard. All those who can help for any area or "water" are asked to state on this their name, address, the area (names of "waters") they will undertake to cover during the summer of 1931, and how many additional schedules

(if any) they will require. The card should then be returned at once to *T. H. Harrisson, Pembroke College, Cambridge.*

It is most important that those who undertake to observe in a definite area should first make sure that they can visit all the waters to a minimum size of, say, 5 acres in that area, otherwise serious gaps will appear in the results. If any observer is subsequently unable to cover his area, it is most important that we should be notified immediately. Observers are by no means required to keep to their home areas, and are asked to send data from any part of the country, whether for 1931 or previous years. Those who have notes some years old for any area, but none for 1931, are asked to send what they have.

HINTS.

We suggest that keepers and owners are often able to furnish useful information for previous years, and that every opportunity of consulting them should be taken. Notes from foreign countries, especially where the Great Crested Grebe is more or less colonial, are wanted, and though we are not attempting a census in Ireland, notes from that country will be very welcome.

FOOD.

Much more data on food is needed, as this is a subject of primary importance. Dr. Walter E. Collinge has already given us valuable help on this point, and has now very kindly agreed to examine all material and write a full report on the subject of the bird's food. This report will be published in these pages in conjunction with our Report on the whole enquiry. Will all those who can obtain stomachs, or preferably whole birds (from oiled or storm-driven birds, etc.) please send them to T. H. Harrisson. A great deal of data on food may also be obtained by field observations.

HABITS.

We hope that observers will make a special point of studying the breeding and other habits of the bird with a view to giving information on the supplementary points in the schedule. E. Selous, H. Boase, J. H. Owen, D. Gunn and others have published some interesting material, but a great deal more remains to be done.

We have decided not to deal with courtship in any detail, as this has been fully and adequately studied by Professor Julian Huxley and E. Selous.

RINGING.

It is unfortunate that the Great Crested Grebe is extremely difficult to "ring"; but perhaps some ingenious reader may devise a method of trapping the adults, or the young when they are sufficiently grown to take the correct sized ring. If this could be done the results should prove of great interest.

LITERATURE.

We should be greatly obliged if any who may be able to help us, by undertaking to investigate and analyse the literature of the subject for any complete county or counties, will communicate with us, as such assistance would be very welcome. Already two correspondents have proved of great service in this direction.

All readers, whether they are themselves able to assist or not, are urged to draw the attention of other ornithologists, societies, lake owners, and the local press to this enquiry.

DIFFICULTIES.

We must here point out two difficulties which we experienced during 1930 in Surrey. These may be overcome if the recommendations here made are adopted.

- (a) In some areas (probably most) there is a well-marked May passage migration, continuing after some birds have commenced nesting operations. Thus, on some "waters" the May population is in excess of the breeding population, and birds may also appear on "waters" where they do *not* stay to breed.

This difficulty is best overcome by taking a final count in June or July. It is certainly not advisable to rely too much on April or May figures.

- (b) Care should be taken to distinguish between pairs which have been robbed of their eggs and non-breeding birds. Local enquiries and the behaviour of the pair will usually decide this point.

Other minor difficulties in obtaining a correct census will be encountered as is always the case in any such work, but late June or July counts (where possible) will overcome these. Any difficulties or queries should be notified as soon as they arise, so that any of general concern may be dealt with through *British Birds*.

We feel, however, that where time is limited, it will be best to concentrate on including all "waters," to ascertain on

which Great Crested Grebes breed, rather than spending much valuable time in attempting to obtain precisely accurate counts of pairs on a few lakes. It must also be remembered that Great Crested Grebes may nest on quite small "waters," and frequently do so on ponds of five acres or less.

RESULTS.

Results will be published in *British Birds* as soon as possible after the close of the enquiry. All schedules should be sent in by October 1st, 1931.

The success of the scheme depends on the enthusiasm and response of readers. Will they do all they can to help?

THE SCHEDULE.

The following is a copy of the wording of the Schedule issued with this number:—

GREAT CRESTED GREBE ENQUIRY, 1931.

T. H. HARRISSON, P. A. D. HOLLOM, supported by *British Birds*.

Name and Address of Observer.....

County referred to in this Schedule.....

Return Schedules (not later than October 1st, 1931) and address all communications to T. H. HARRISSON, PEMBROKE COLLEGE, CAMBRIDGE.

Use a separate Schedule for each county (additional Schedules will be supplied on application).

Use a Schedule even if only one "water" is referred to.

If a "water" has alternative names, please give them and make clear its exact location, specifying distance and direction from nearest place traceable on large scale map. If secrecy is really insisted on, please state name of locality, which will be regarded as confidential.

Make entries clearly and concisely. Give additional information when available on separate sheets.

Where no accurate information is available for columns 2 and 3, more general statements will be useful.

N.B.—It is best to take counts in June and July. Even quite small ponds may hold breeding pairs.

Please read full details of scheme in *British Birds* (Magazine), February, 1931.

[The following points, numbered 1 to 7, are set out, with space for replies]

1. Name and exact situation of each "water" at which bred, 1931.

2. Number of breeding pairs at each "water," 1931, and date counted.

3. Year in which each "water" was colonized (if unknown, give earliest date).

4. Number of breeding pairs for years prior to 1931.

5. Is there any apparently suitable "water" on which it NEVER breeds? [If so, please give name and suggested reasons (food, cover, depth, pollution, nature of bottom, etc.) for absence.]

6. Is there any "water" on which it HAS bred in any other year, but NOT in 1931? [If so, please give name, details and suggested reasons for absence.]

7. Does the population in the area appear to be stationary, at a maximum, increasing, or decreasing? Give dates when known. [Notes on decrease are especially wanted.]

SUPPLEMENTARY data on any of the following points will be very welcome, and may refer to any locality (including foreign countries) and should be sent on sheets marked with observer's name and address and locality referred to in each case. Separate sheets should be used for each point, numbered as below:—

8. MIGRATIONS.—Passage migration. Winter records. Dates of arrival and departure. Resident or winter visitor?

9. NESTS.—Position and cover. Does breeding-season vary according to cover? Notes on building; materials. Dates of laying.

10. OTHER BREEDING HABITS.—Number of eggs and at what intervals laid; incubation period; number of young hatched and reared. Age to which young are fed. Share of sexes in nest building, incubation and care of young. Double brooding (with details).

11. MORTALITY.—Effects of weather, oil, enemies (including man).

12. NON-BREEDING BIRDS.—Any evidence for presence of non-breeding birds, with full particulars.

13. FOOD-HABITS.—Quantity and quality. Species and percentage of fish, vegetable, insect and other foods (species where possible). Hours of feeding. Depths favoured. Times of dives.

14. TERRITORY.—Extent of combat between pairs at different seasons. Semi-colonial nesting. Size of feeding area.

15. RELATIONS WITH OTHER SPECIES.—(Especially Mute Swan, Little Grebe and Coot).

[The proposed Great Crested Grebe Enquiry described above seems to us of great importance and interest and we feel sure that it will meet with the hearty support and active co-operation of our readers. Messrs. Harrisson and Hollom have already devoted a great deal of time to the subject. By their preliminary work they have gained valuable experience and are now well aware of the difficulties and great labour involved, and they are, notwithstanding, prepared to continue to devote themselves during 1931 to the organization and working out of the enquiry. They have shown themselves capable of doing this successfully, both by their enthusiasm and methods, and we sincerely hope that readers of *British Birds* will give the scheme whole-hearted support, so that the results achieved may be so complete and wide-reaching as to be of great scientific value and importance.—THE EDITORS.]

NOTES

ROOK CARRYING UP AND DROPPING "POT" EGG.

ON May 22nd, 1930, in south Durham, I saw a Rook (*Corvus f. frugilegus*), whose white "face" proved it was an adult, struggling with something small, which it held between its claws on the ground. After a short time the bird rose to a height of about 4 or 5 feet holding this object with the claws of both its feet and dropped it. The bird then pounced down upon it immediately. This performance was repeated six times, the height to which the bird rose never varying. I then disturbed the Rook, which flew to a rookery leaving the object behind it. The latter proved to be an imitation fowl egg made of pot. I made enquiries and discovered that a number of similar pot eggs were missing from nests in a duck pen.

F. J. BURLINSON.

[The habit of carrying shell-fish, etc., up to a height and dropping them is well known in Gulls and the Carrion and Hooded Crows and has often been described. The most recent observations on the subject are contained in an interesting article by Mr. C. Oldham in *The Ibis*, 1930, pp. 239-243. We do not, however, think the habit has been before ascribed to the Rook and the height from which the egg was dropped is unusually low. The fact, which Mr. Burlinson is also positive about, that the Rook carried up the egg in its feet and not in its bill is unexpected.—EDS.]

SNOW-BUNTINGS IN LANCASHIRE.

AN experience with two flocks of Snow-Buntings (*Plectrophenax nivalis*) suggests that there may have been a big influx of these birds on the Pennines this winter.

Mr. Irvine Whittaker informed Mr. Fred Taylor that he has seen a Snow-Bunting on Ashworth Moor, near Rochdale, on December 14th, 1930, and on January 4th, 1931, Mr. Taylor and I visited the district, and after much searching found on the southern side of Cowpe Lowe—at an elevation of about 1,300 feet—a flock of between 35 and 40 Snow-Buntings. They were very active on the ground, which was rough pasture, running quickly and feeding industriously near together, paying little regard to our approach, although sometimes flying around without being alarmed. When feeding, they were all silent, but they flew up with a noisy

swirl of wings in close formation, twisting and turning like Starlings, uttering finch-like twitterings, varied by odd notes suggesting the trill of the Dunlin and the "scaape" of the Common Snipe.

We flushed another party of at least 60 Snow-Buntings which rose above the skyline and gave us a fair chance of estimating their number. These birds also were extremely noisy on the wing. On looking up this locality on the map, we found that it was at a rough elevation of 1,300 feet and of similar nature to the parts of Cowpe Lowe where the first flock of birds was observed.

On January 18th Mr. Taylor and I visited Rooley Moor, and at the same place where we had seen the flock of about 60 Snow-Buntings on January 4th we met with the same flock presumably. There were also 7 Snow-Buntings flying about the moor. We were pleased to find the birds once more, as there had been a spell of severe weather between the two visits.

JOHN ARMITAGE.

GREY WAGTAIL SWIMMING.

ON December 27th, 1930, while I was watching three Grey Wagtails (*Motacilla c. cinerea*) on the Nervia River, near Bordighera, Italy, one of them suddenly waded into the water, then swam right across a deep pool, about 6 ft. wide, to another low-lying rock. It made a slight commotion while swimming, but seemed perfectly at home in the water. As I have never seen or heard of a Grey Wagtail swimming, although they often wade, this incident seems worth recording.

M. BARCLAY.

COURTSHIP DISPLAY OF THE BLACKBIRD.

ON December 25th, 1930, in Sefton Park, Liverpool, my attention was drawn to a cock Blackbird (*Turdus m. merula*) by his unusual attitude and guttural notes. A hen was picking about in the shrubbery and the cock kept about six inches to a foot distant during his display. His head was bowed, with the bill nearly touching the ground, the tail-feathers spread to their utmost width and scraping along the ground and his back apparently humped up. As he ran about in circles and figures of eight before the hen he uttered a rather squeaky, guttural cry, which ceased when he was stationary. The movement lasted sometimes for a few seconds and sometimes for a full minute. The hen made no attempt to run away, but was apparently unconcerned and

went on feeding till disturbed by a passer-by, when she followed the male at once.

On the same morning I heard and saw two male Blackbirds in song—an unusual event before February in the case of this species.

ERIC HARDY.

EARLY AND LATE SWALLOWS AND CURIOUS NESTING-SITE IN KENT.

AN early Swallow (*Hirundo r. rustica*) was observed at Kingsgate on March 16th, 1930; the weather was fine and clear, but rather cold. Only one bird was seen, which was flying low over the bay.

The last Swallow I saw from Margate front on December 8th, 1930, flying low towards the south-west. The weather was bright and fairly mild, only one bird seen.



I found a rather late nest of the Swallow on September 28th, 1930, which contained five young about a week old, built under a low bridge near Sandwich.

With reference to recent notes (Vol. XXII., p. 160, and

Vol. XXIII., p. 190) on unusual nesting-sites of the Swallow, the photograph herewith of a nest built on the top of a bunch of netting hanging in an old barn at Bromstone Farm, Broadstairs, may be of interest. LIONEL H. DAGLEY.

PEREGRINE FALCON WITH FOUR YOUNG AND ONE EGG.

WITH reference to Mr. C. V. Stoney's note on a Peregrine Falcon (*Falco p. peregrinus*) rearing five young (*antea*, Vol. XXIII., p. 221) I may record that in company with the late Mr. J. G. Black, of Corbridge-on-Tyne, I discovered in June, 1921, an eyrie near Rothbury, Northumberland, containing four half-fledged young and one unfertile egg.

D. E. GREEN.

COMMON BUZZARDS IN CHESHIRE.

THE Common Buzzard (*Buteo b. buteo*) is now so plentiful in the Lake District and in Wales that more frequent reports of its occurrence in Cheshire are perhaps not surprising.

Since 1924 they have been seen on at least nine occasions, with one exception in autumn or winter; three of them were killed and I have examined two of them.

The occurrences were as follows:—

Mr. R. M. Garnett watched one flying east over Prestbury in east Cheshire on January 27th, 1924, and on December 21st of the same year saw another in Adlington Park in the same district.

During the autumn of 1925 one was killed at Whatcroft in the Dane Valley, near Northwich, and was preserved by Mr. E. M. Baerlein, who has shown the bird to me. Just about the same time Sir Lees Knowles reported in the *Manchester Guardian* of September 19th that one was killed on September 16th, 1925, on the Lightoaks estate at Glazebury in south Lancashire, about three miles from the Cheshire border.

In 1926, on July 18th, Mr. H. Harrop watched two Buzzards circling over a wood at Stalybridge in N.E. Cheshire, and later saw them fly over the town and alight on a mill chimney. He was satisfied that his identification of them as Common Buzzards was correct. (*Lancs. & Ches. Fauna Committee Report* for 1926.)

In 1928 Mr. R. M. Garnett again saw a bird in Adlington Park on February 18th, where the keeper had seen it earlier in the month; one appeared there later in the year and was

seen by the keeper in October and by Mr. Garnett on December 26th.

Finally Mr. C. R. Longe showed me an adult female in the flesh which had been caught in a rabbit-trap on October 27th, 1930, at Ashley on the Tatton Estate. This bird is now preserved in the Manchester Museum. Mr. H. Britten, of the Museum, on examination found on the feathers a number of *Lipeurus fuscus* Nitz., a species of Mallophaga—both adults and empty ova.

A. W. BOYD.

RED-BREASTED MERGANSER AND VELVET-SCOTER IN HERTFORDSHIRE.

UNLIKE the Goosander and Smew, which occur in most winters, the Red-breasted Merganser (*Mergus serrator*) seldom visits the Tring waters. Indeed, it does not seem to have been noticed between January, 1901, when three were shot (Hartert and Jourdain, *Birds of Bucks.*, Novit. Zool., XXVII., p. 221), and April 6th, 1930, when I saw a brown-headed bird with a fine mane-like crest, apparently an adult female, on the Wilstone Reservoir.

On December 3rd, 1930, there were two Velvet-Scoters (*Oidemia fusca*) on the same reservoir. They were of equal size and in similar plumage, that of the adult female. The small, round, white spot below the eye, clearer than the whitish patch between eye and bill, was surprisingly conspicuous at some distance across the water. When I saw them again on the 4th the birds were close to a grey-cheeked Common Scoter (*Oidemia nigra*), compared with which they were larger, browner in colour and clumsier in build, and differed, too, in having a white wing-bar that showed up well even when the birds were swimming. The status of the Velvet-Scoter in Hertfordshire has rested hitherto on the unconvincing statement made more than sixty years ago by the Rev. H. Harpur Crewe to the effect that on two occasions it had been observed in cold weather on the Wilstone Reservoir (A. W. M. Clark Kennedy, *Birds of Berks. and Bucks.*, p. 206).

CHAS. OLDHAM.

RAPID COLONIZATION BY THE GREAT CRESTED GREBE.

THAT the number of Great Crested Grebes (*Podiceps c. cristatus*) nesting in some parts of England is largely determined by the frequency of nesting sites of a certain type can, I think, be proved from the remarkable rapidity they show in colonizing an entirely new water.

A new reservoir in the Midlands, completed in 1928, was filled with water for the first time early in January, 1929. The area of the water is approximately 136 acres and I learn from Mr. G. B. Kershaw that, though the average depth is 7 feet and the depth at the dam 24 feet, there are many acres where it varies from 18 to 24 inches only.

On June 7th, 1930, only eighteen months after the filling of the reservoir, and although the shallow end and sides were still almost bare of reeds and rushes, I counted fifteen nests of the Great Crested Grebe, all at this end in the shallow water, each with an old bird sitting on it, and one more which a pair was building; several of these were only a yard or two apart, and there was in fact a bunch of about ten or twelve in a more or less compact group.

Several other nests were placed at intervals round the reservoir, making a *minimum* total of twenty nests for the water.

Though they nest in plenty on the Cheshire meres, a pair very often has a reed-bed to itself, and I have never seen anything approaching this gregariousness; often enough a pair seems to have its own definite territory.

On the other hand, I know of few localities with so extensive an area of shallow water attractive for nest-building, though it is true that one other Midland reservoir I visit has a large piece of shallow water that they do not favour to the same degree.

A colony of this sort seems to approximate in density more to that of the Black-necked Grebe in Ireland, as reported in *British Birds* for December, 1930 (Vol. XXIV., pp. 170-172).

Coots (*Fulica a. atra*) also were nesting in plenty, and an attack by one of them on a Great Crested Grebe's nest is perhaps worth putting on record.

The Coot persistently pulled the nest to pieces and the two Grebes were evidently afraid to protect it, nor did any other Grebe show any interest; the pair swam side by side in great distress, and though I was too far off to hear the noise they made I could watch their open bills vibrating; every now and then one of them would dive; and I hoped to witness an under-water attack on the Coot, but in every case the Grebe's courage failed.

Apart from this, the colony seemed to be living in perfect harmony.

A. W. BOYD.

QUAIL IN WILTSHIRE IN DECEMBER.

My friend, Mr. T. C. Pinniger, of Westbury, Wiltshire, shot a Quail (*Coturnix c. coturnix*) on December 26th, 1930. A

few pairs of these birds nest in the neighbouring Downs most seasons, but they are generally gone before the middle of September.

W. SHORE BAILY.

RECOVERY OF MARKED BIRDS—*Correction*.—Black-headed Gull No. 28733 (*antea*, p. 216). This record must be deleted and was due to a confusion of numbers.

HEN-HARRIER IN KENT.—Mr. L. H. Dagley informs us that he saw an immature Hen-Harrier (*Circus cyaneus*) near Broadstairs on several occasions from November 28th to December 4th, 1930.

LETTERS.

"REED-BUNTING SHELTERING YOUNG FROM SUN."

To the Editors of BRITISH BIRDS.

SIRS,—The reluctance exhibited by Mr. B. B. Osmaston in your December issue (p. 197) to accept J. H. Owen's explanation of the



action depicted by the Reed-Bunting seems curious to one who has observed scores of passerine birds displaying the same action under similar conditions. I admit the action may *also* help comfort in the

adult. It is well known that exposure to strong direct sunlight is detrimental to the point of death to nestling passerines. No photographer of birds who for the sake of photographic exposure has found it desirable to part and tie back the protecting herbage should leave without first replacing the leafy protection.

The most obvious case I have experienced concerned a pair of Reed-Warblers. The reeds had been parted and tied. The sun at first was obscured. When the hot sun burst through the clouds the young Cuckoo which occupied the nest became obviously affected; and one of the Reed-Warblers, after feeding, often stood with wings extended above the nestling for minutes together, instead of flying away for more food at once, as formerly! The Reed-Warblers went further. When a slight air-current whispered through the reeds, the bird standing with wings spread over the nest folded one wing and turned partly on one side, extending the other wing upward almost fully, and remained so; thus a current of air was directed down into the nest where lay the panting young Cuckoo. This action was performed a number of times during the next half hour, but was abandoned when the breeze had increased in strength a little. RALPH CHISLETT.

REPORT ON SOMERSET BIRDS, 1929.

To the Editors of BRITISH BIRDS.

SIRS,—Your reviewer, in Vol. XXIV., pp. 229–230, has made a "grave mistake" in the second line of this review, for the words "Somerset Natural History Society" should have been rendered "Ornithological Section of the Somerset Archaeological and Natural History Society." This makes all the difference.

The Somerset Archaeological and Natural History Society consists of a thousand members. Certain of these members also belong to one or more of the Natural History Sections of the Society—Ornithological, Botanical, Entomological, etc., and under certain financial and other arrangements, non-members of the Society may become members of the Sections. The Sections to a very large extent manage their own affairs.

The declaration in question was passed by the votes of a majority attending a meeting of the Ornithological Section, and had nothing to do with the Parent Society.

I subscribe myself as the Curator of the Somerset County Museum (belonging to the Society), and as Secretary and Treasurer of the Ornithological Section. H. ST. GEORGE GRAY.

[We regret the misstatement and must plead that owing to our ignorance of the constitution of the Society we did not realize that anyone could still remain a member of the Society and yet be excluded from his appropriate section.

Since, however, the rule only affects ornithologists, and excludes those who do not subscribe to the declaration from work with the ornithological section, our criticism remains.—EDS.]

REVIEW.

The Formenkreis Theory and the Progress of the Organic World. By Dr. O. Kleinschmidt. Translated by the Rev. F. C. R. Jourdain, M.A., M.B.O.U., F.Z.S., etc. 192 pp. 16 plates and numerous text-figures. (Witherby) 1930. 10s. 6d.

THIS excellent translation by Mr. Jourdain from the German of Dr. Kleinschmidt brings to the notice of English-speaking readers a theory

which has a considerable following in Germany, but is little known to zoologists in England or America. Though applying to the Animal Kingdom in general it is primarily based on the author's studies of birds. We are told that the essential ideas of the theory are found already in the writings of the philosopher Kant. The *Formenkreis*, according to Kleinschmidt, is the true, natural species, occasionally only a single form, but normally an assemblage of allied races replacing one another geographically and all derived from a common stock. Sometimes the *Formenkreis* is identical with a generally accepted species, but equally it may include two or more forms normally considered as specifically distinct. Thus, if it can be demonstrated that two forms differing quite widely in appearance are yet connected by intermediate forms occupying definite areas and replacing one another geographically they must all belong to one *Formenkreis*. This may be illustrated by the case of the Gyr-Falcons, Lanners, and Sakers (*Falco rusticolus*, *biarmicus*, *cherrug*, etc., of authors), which the author claims he has proved to be all races of one *Formenkreis* (including representatives even in Mexico and Australia), which may be compared with the parallel case of the various forms of Peregrines (*Falco peregrinus*). Other show-pieces of the theory are the two *Formenkreises* of the black-capped Tits (= *Parus palustris* and *P. atricapillus*) and the two of the Crested Larks (= *Galerida cristata* and *G. theklae*).

So far, it will appear that the *Formenkreis* is really very much the same as the current conception of a species with its various subspecies. Even where it differs it does not seem to us that the difference is irreconcilable. If Dr. Kleinschmidt's views on the intimate relationship of the various forms of his Gyr-Falcon *Formenkreis*, for example, proved (we do not say they will) generally convincing to orthodox systematists, there seems no reason why they should not all be degraded to races of one species without any fundamental modification of current taxonomical practice, for which we fail to see that any good case has been made. It seems possible, however, that in a qualified sense the conception of the *Formenkreis* as a circumscribed geographical assemblage of interconnected forms more intimately allied to one another than to any other form or forms may prove helpful in zoology, as a special category of somewhat wider range than the species as commonly understood. Such groups might perhaps be interpreted as the result of the radiation into different racial forms of a single ancestral species within geologically recent times. But we might still, if we found it convenient, call the extremes species, for at least we may fairly regard them as potential species or species in the making, and unless all new species arise by relatively considerable mutations it must always be a largely arbitrary matter to say just where an organism ceases to be a race and becomes worthy of independent specific rank. Robson (*The Species Problem*, 1928) has shown that there is no absolutely universal and unvarying criterion by which species can always be recognized.

Such ideas as these, however, would be indignantly repudiated by our author. They are the very follies and illusions which the *Formenkreis* Theory is to sweep from the cobwebbed minds of zoologists. For as yet we have only told half the story. No race, says Dr. Kleinschmidt, can ever give rise to a new species or *Formenkreis*. The whole of contemporary biology is on a wrong scent and "a mistake has been made with regard to the theory of evolution". In the light of the *Formenkreis* Theory "relationship and the idea of a common origin are only recognized within one and the same *Formenkreis*". No relationship is demonstrable between different *Formenkreises*! They

are all independent evolutions radiating out from some primitive basal stock of life which is unknown and presumably unknowable.

Here we drift away from reality and scientific method altogether, and not all the author's repeated assurances that this is the one thing above all others that the Formenkreis Theory does *not* do can convince us to the contrary. No doubt Dr. Kleinschmidt would be hard to argue with, for facts which appear to the average zoologist so self-evident as to be unassailable are not so at all to him and vice versa. We may concede that zoologists after Darwin were too cock-sure about the methods of evolution, that Natural Selection alone is not as all-sufficient as it was supposed to be, even that we have still almost everything to learn as to just how species originate from one another, yet the broad fact that they have so originated is so absolutely unavoidable a deduction from the facts of comparative anatomy, palæontology, and every other available source of evidence that it is now practically universally admitted by everyone, except Dr. Kleinschmidt and the Fundamentalists, to be outside the sphere of controversy.

The phenomena of Mimicry in animals are held up as an alleged proof that organisms may resemble one another without relationship. But, however we interpret these strange resemblances, the very essence of them is that they are only skin-deep and that a closer examination immediately reveals this fact. Such resemblances are in no way comparable to the complete agreement in every essential feature of structure and organization which is found in the members of the recognized orders, classes and other groups of animals. And if these marks of relationship are insufficient, the evidence from palæontology, and notably from such fossils as the famous Jurassic birds, *Archæopteryx* and *Archæornis*, with their extraordinary complex of palpably reptilian characters, would be conclusive to most minds. If these things do not mean that the larger groups of animals have been derived one from another and are genetically related in essentially the same way as the races of a species then logical deduction from evidence means nothing and Science might as well close down.

But facts like these mean nothing at all to Dr. Kleinschmidt. They are all swept into the waste-paper basket in favour of a strange conglomeration of unsupported assertions, zoological half-truths and imaginative theorizing, which he offers as a complete system of biological philosophy. From start to finish the whole presentation of the subject is so bound up with these bizarre ideas and so lacking in coherence that it is not easy to arrive at a clear evaluation of the more acceptable parts of the work. The difficulty is not lessened by the irritatingly superior and dogmatic tone of much of the writing, which strikes us as curiously inappropriate where we might have expected a serious marshalling of evidence to convert the scientific world to a new theory.

We have already indicated our personal impression that up to a point the Formenkreis may have something in it, though not in the sense of a magic domain within which the relationships of the included animals to one another and to forms outside are of an entirely different nature. We do not think that the Formenkreis in a less pretentious form is inseparable from, or must necessarily stand or fall with, the uncouth trappings which the author has bound up with it, and the latter should not, we think, prejudice the former from obtaining a fair consideration, whatever the ultimate judgment may be. But with regard to the theory of evolution we think it more likely that Dr. Kleinschmidt is "off the rails" than the whole of modern zoology.

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NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U.

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AN ORNITHOLOGICAL TRANSECT OF THE NORTH ATLANTIC.

BY

E. M. AND B. D. NICHOLSON.

(Plate 3.)

SCOPE AND ACKNOWLEDGMENTS.

IN 1928 on the voyage to Greenland we had carried out some sort of an ornithological transect of the extreme North Atlantic (*antea*, Vol. XXII., pp. 122-133). It therefore seemed worth while to make a comparable set of observations on the much more southerly crossing made in 1929 by the Oxford University Expedition to British Guiana, 1929, of which this paper is a result. The circumstances were rather different. In this case a triple instead of merely a double transect was undertaken, along a single course of 4,400-4,700 miles from London to Georgetown via the West Indies. The first was carried out jointly by E.M.N. and B.D.N. on the trip starting from West India Dock on July 19th and finishing at Georgetown on August 5th; the second by B.D.N. on the return trip sailing from Georgetown on October 4th and ending at Royal Albert Dock, London, on the 27th, and the third by E.M.N. from Georgetown (November 30th) to West India Dock (December 20th).

We have to acknowledge the valuable and frequent help of other members of the expedition, passengers, officers and crew of the Harrison liner "*Ingoma*", in which all three crossings were made. To Captain Willis Gibbings, who allowed exceptional facilities for the ornithological work and did everything in his power to assist it, special thanks are due.

The amount of work of this nature which has been carried out in the North Atlantic is already considerable, but much of it remains unpublished and what has appeared is so scattered and unco-ordinated that adequate reference to literature would involve disproportionate labour and (if incorporated) would swamp so brief and unpretending a paper as this. We are therefore printing our observations in the shape of raw material, deliberately omitting reference to other work. We hope later to follow this up with a badly-needed third paper reviewing all available material, including our own. In the following account we propose to take briefly the three trips in turn, describing general conditions met with, and finally to review in detail material relating

to the different species. The ship's position (latitude and longitude *at noon*) is inserted after each date mentioned in the narrative, and also on the map. All times given are ship's time, corrected for position.

FIRST TRIP, JULY-AUGUST, 1929.

On the first trip a rough count about 10 a.m. on July 20th (50° 10' N., 3° 27' W.) showed

Gannets (<i>Sula bassana</i>) immature	...	4
Herring-Gulls (<i>Larus argentatus</i>)	...	19
Lesser Black-backed Gull (<i>L. fuscus</i>)	...	1
Puffins (<i>Fratercula arctica</i>)	...	6
Guillemots (<i>Uria aalge</i>)	...	9 (plus 19 doubtful)
Razorbills? (<i>Alca torda</i> ?)	...	2

Immediately afterwards, the first of a series of 10-mile counts was begun at 10.15 a.m. At least six species were recorded, Herring-Gulls (36) being most numerous. The remainder of the total (80) consisted of "Auks" (Guillemots or Razorbills), 18; definite Guillemots, 11; Puffins, 4; Gannets, 8; Lesser Black-backs, 3.

The close similarity in composition of these two successive counts is a check on the sample value of the method.

About noon, some 7-8 miles off Start Point, we passed the "American Trader", eastbound, with 63 Gulls following, and a good many White-rumped Petrels (Stormy? : *Hydrobates pelagicus*?) were seen flitting about in sight of land, 5 together at one point. A second ten-mile count, between 4.17-5.10 p.m., showed 40 per cent. reduction, with 48 wild birds, of which 42 were Herring-Gulls, 1 Lesser Black-backed, and 5 immature Gannets. Auks had already disappeared for good. In addition, 4 Homing Pigeons were observed, of which 2 stayed on board all night, the other 2 flying off north in the evening. According to the ship's officers, Homing Pigeons often come aboard, and off Start Point we saw flights of 13, 16 and 4 birds between 5-12 miles from land. Later, one of these Pigeons was seen dashing down among Herring-Gulls in pursuit of some object on the surface of the water, on which it momentarily alighted without folding its wings. The 20th was fair, with sea smooth and wind light.

On 21st (47° 53' N., 10° 08' W.) the change was very marked, with no Gulls, Gannets or Auks, a fresh S.S.E. wind, dull sky and some rain. The third ten-mile count (9.55-10.40

a.m.) showed another heavily reduced total of 20 wild birds, of which 4 were Storm-Petrels (sp.?) in the wake, and 16 Mediterranean Shearwaters (*Puffinus kuhlii* subsp.?). The 2 tame Pigeons were released about 10.30 a.m., one being tailless. They flew off north, but returned to the ship.

The fourth ten-mile count on the afternoon of the 22nd (45° 47' N., 15° 38' W.) showed 3 Mediterranean Shearwaters only, although a flock of some 50 had been observed about 2.30 p.m.

The fifth count on the afternoon of 23rd (43° 23½' N., 20° 54' W.), which was cloudy with sea light and a stiff breeze, showed 9 Wilson's Petrel (*Oceanites oceanicus*) and 2 Mediterranean Shearwaters.

On the morning of 24th (40° 38' N., 26° 43½' W.) the sixth ten-mile count gave 7 Mediterranean Shearwaters and 1 Petrel (Wilson's?). The proximity of the Azores made surprisingly little difference, although on the morning of 25th (37° 52½' N., 32° 06' W.) a fair sprinkling of Mediterranean Shearwaters and 1 Petrel (Wilson's?) were noticed, while an unidentified dusky bird intermediate in size between Storm-Petrel and Manx Shearwater, with rapid zigzagging limicoline flight, may possibly have been Bulwer's Petrel (*Bulweria bulwerii*?). About 11.30 a.m. a probably Common Tern (*Sterna hirundo*) flew round for some time, passing close enough astern to show the reddish, black-tipped bill. It was foraging and diving freely. The seventh ten-mile count, taken in the afternoon, yielded nothing except 5 Petrels, probably Wilson's.

On 26th (34° 23' N., 36° 30' W.) and 27th (30° 52½' N., 40° 51' W.) no birds were seen all day long, so far as we could learn, by anyone on board. Flying fish became fairly plentiful for the first time. A nautilus and a turtle were also seen on 26th. On 28th (27° 18½' N., 45° 01½' W.) there were again no birds except 5 White-tailed Tropic-birds (*Phaëthon lepturus*) which came round the ship in a body about 3.40 p.m. On 29th (23° 48½' N., 49° 05½' W.) the only birds were a Mediterranean Shearwater and a Tern (sp.?) of brownish plumage, reported by other members of the expedition. On 30th (20° 24½' N., 53° 12½' W.) a fine mature Laughing Gull (*Larus atricilla*) followed for some time. Another immature Gull, a Tropic-bird and 3 limicolines, probably Plovers, with leaden-grey upper plumage, were also noted.

On July 31st (16° 42½' N., 56° 45' W.) there were no birds. On August 1st, about 6.45 a.m., we sighted Barbados, and

soon afterwards small parties of up to a dozen Terns (Sooty or Brown-winged?) were seen flying low over the waves. Two Tropic-birds and 1 Dusky Shearwater (?) (*Puffinus assimilis*?) were added before reaching Bridgetown. On August 2nd we reached Grenada about 9 a.m., having seen many Laughing Gulls, Shearwaters and Sooty Terns (?) (*Sterna fuscata*?) off the east coast and half-a-dozen Magnificent Frigate-birds (*Fregata magnificens*) and Brown Pelicans (*Pelecanus occidentalis*) and one Royal Tern? (*Sterna maxima*?) in St. George's Bay. On 3rd, off Port of Spain, Frigate-birds and Dusky-tailed Skimmers (*Rhyncops cinerascens*) were numerous, but Brown Pelicans few, and there were no Gulls. A lumpy, short-tailed Tern with black cap and bill, sitting on a buoy off the quay-front, was probably Gull-billed (*Gelochelidon nilotica*). A Leach's Petrel (*Oceanodroma leucorhoa*) was caught on board here. On August 4th-5th, from Port of Spain to Georgetown, birds were few and none specifically identifiable.

SECOND TRIP, OCTOBER, 1929.

On the second (eastbound) trip the "Ingoma" sailed from Georgetown about 4 p.m. on October 4th with several Laughing Gulls following. A count on October 5th (10° 30' N., 60° 19' W.) from 3 to 4 p.m. showed 4 Dusky-tailed Skimmers only. A little later, off Trinidad, Laughing Gulls became frequent. After calling at Port of Spain, La Brea, Grenada, St. Vincent, Barbados, St. Lucia and Montserrat the second Atlantic crossing was finally begun on October 13th. An hour's watch as soon as land was cleared showed no birds, but at sunset a single Frigate-bird was observed, soaring high, far to the west. On 14th (19° 21' N., 58° 24' W.), with a slight sea running and fresh breeze, no birds were seen except a Semi-palmated Sandpiper (*Erunetes pusillus*) which was captured when it alighted in an exhausted condition. On 15th (22° 13' N., 54° 41' W.) there were no birds, and on 16th (25° 00' N., 50° 49' W.) none except an immature Blue-faced Booby (*Sula dactylatra*) at 2.15 p.m. On 17th (27° 35' N., 47° 08' W.) no birds. On 18th (30° 24' N., 43° 05' W.) at 5.15 p.m. a brownish passerine about 7 inches long, apparently with some white in the tail, was put up on board, and flew quite strongly, taking refuge in a lifeboat. It may possibly have been one of the larger *Tyrannidæ*, but it eluded capture and identification. Here, in any case, was a smallish land-bird surviving in good fettle on a ship

approximately 1,340 miles from the nearest land astern, and more than 900 from the nearest in any other direction, whether or not it had just arrived when discovered. The date, well on in the autumn migration season, is perhaps significant. On October 19th ($33^{\circ} 03' N.$, $39^{\circ} 07' W.$), with a strong N.E. wind, several Storm-Petrels (Wilson's?) were observed during the day. (The ship's doctor had seen two similar birds the morning before.)

On 20th ($34^{\circ} 58' N.$, $35^{\circ} 47' W.$), with a 6-point wind from N.E. and high seas, at least 3 Storm-Petrels were seen, and two more on 21st ($37^{\circ} 26' N.$, $31^{\circ} 27' W.$), when the wind had dropped. On 22nd ($40^{\circ} 00' N.$, $26^{\circ} 50' W.$), in sight of the Azores, a number of Mediterranean (?) Shearwaters passed the ship. No more were seen for four hours, and only two during the afternoon. One Storm-Petrel was noted and at 2.30 p.m. a Herring or Lesser Black-backed Gull flew over at a good height going S.W. with the wind. It made a detour to pass over the ship. On 23rd ($42^{\circ} 44' N.$, $21^{\circ} 47' W.$) about 9 a.m. several Storm-Petrels, almost certainly Wilson's, were following in the wake. An attempt at counting later failed, but there were about 40 of them. At 9.20 a.m. 5 Herring-Gulls came up and settled in the wake, and at 10.50 a.m. an immature Kittiwake (*Rissa tridactyla*). At 11.20 a.m. a Skua, apparently a Pomatorhine (*Stercorarius pomarinus*) in the dark phase settled in the wake among the Storm-Petrels. At 1 p.m. a Fulmar (*Fulmarus glacialis*) was identified and at 2 p.m. a flock of at least 80 Mediterranean Shearwaters on the water. An hour's count, 2.20-3.20 p.m., showed about 43 Wilson's Petrels, 5 Mediterranean Shearwaters, 17 Fulmars and 1 Sandpiper, small (sp.?).

On 24th ($45^{\circ} 26' N.$, $16^{\circ} 30' W.$), which was rough with a N.W. wind, overcast and squally, weather in the afternoon made difficulties for the use of glasses. Visibility for birds was limited to 50 yards. In the morning only occasional Shearwaters were seen. In the afternoon several Wilson's Petrels followed. Later, only Fulmars and Shearwaters in the ratio of 3 or 4 to 1. About 3 p.m. a small passerine with black-and-white wings and a good deal of yellow on it was seen attempting to reach the ship; a similar bird had been seen aboard earlier the same day.

On 25th ($48^{\circ} 02' N.$, $11^{\circ} 07' W.$) there were in the wake in the morning 25 Kittiwakes, 5 Fulmars, 5 Great Shearwaters (*Puffinus gravis*) and 2 Petrels (Wilson's?). Among Kittiwakes immature birds were in a minority. An attempted

count in the afternoon was thwarted by bad weather. Kittiwakes, accordingly, appeared in strength some 300 miles off the Lizard. On 26th ($49^{\circ} 52' \text{ N.}, 4^{\circ} 55' \text{ W.}$) there were in the wake about 9 a.m. 5 Kittiwakes, 2 Great Skuas (*Stercorarius skua*), 1 immature Herring-Gull and 2 Storm-Petrels (sp. ?). Later 4-6 Gannets passed, an adult Lesser Black-back followed, and several parties of Auks (sp. ?) crossed the bows for the first time since this region had been passed in July. An hour's count, 2.30-3.30 p.m., gave 19 Gannets, 12 Herring-Gulls, 1 Lesser Black-back, 1 Great Skua, and 1 Auk (sp. ?). Auks decreased sharply again coming up Channel. On 27th at 9.30 a.m. there were over 130 Gulls in sight off Dover, all identified being Herring-Gulls.

THIRD TRIP, DECEMBER, 1929.

On the third (eastbound) trip the "Ingoma" sailed from Georgetown on November 30th, calling at Port of Spain, La Brea, Grenada, Barbados, St. Vincent and St. Lucia before putting out past Martinique early on December 7th. On that day ($16^{\circ} 01' \text{ N.}, 59^{\circ} 27' \text{ W.}$) a count gave no birds, but a distant Frigate-bird (?) was seen soaring in the afternoon. On 8th 1 doubtful Frigate-bird is again the only note. On 9th ($22^{\circ} 50\frac{1}{2}' \text{ N.}, 53^{\circ} 16' \text{ W.}$) a Tropic-bird was seen, and a Shearwater or Skimmer (?) in the afternoon. On 10th ($26^{\circ} 18\frac{1}{2}' \text{ N.}, 49^{\circ} 50' \text{ W.}$) 2 Tropic-birds appeared in the morning, one having been heard at night. No birds were seen on 11th or 12th. On 13th ($35^{\circ} 39' \text{ N.}, 37^{\circ} 06' \text{ W.}$), a rainy day, a first-year Kittiwake followed astern from 11 a.m. till mid-afternoon, but no more birds were observed. On 14th ($38^{\circ} 06' \text{ N.}, 32^{\circ} 00' \text{ W.}$) an adult Kittiwake appeared about 12.30 p.m. and 3 adults with 2 immatures an hour later, following till 4 p.m., when Flores, the nearest land, was distant 62 miles. A Purple Sandpiper (*Calidris maritima*), plump but tired, came aboard about 3.45 p.m. No birds were visible except those following. The sea temperature at 8 p.m. was 64° F.

On 15th ($40^{\circ} 46\frac{1}{2}' \text{ N.}, 26^{\circ} 39' \text{ W.}$) a ten-mile count showed 12 adult and 3 immature Kittiwakes; 3 more adults and 1 immature were added in the next ten minutes.

On 16th ($43^{\circ} 19' \text{ N.}, 20^{\circ} 54' \text{ W.}$) the air temperature at 8 a.m. and 1.30 p.m. being 59° F. , wind E., the number of Kittiwakes rose gradually from about 3 at 9 a.m. to above 20 at noon; 47 were following by 3 p.m. No ten-mile count

was taken, as persistent watching found no other species. In the afternoon such a count would simply have given 5 or more Kittiwakes per mile, all but a few being adults.

On 17th ($45^{\circ} 46' \text{ N.}$, $15^{\circ} 09' \text{ W.}$) temperature at 8 a.m. being 54° F. , the number of Kittiwakes rose from 5 (9.30 a.m.) to over 60 by 2 p.m. Again there were no other birds.

On 18th ($48^{\circ} 14' \text{ N.}$, $9^{\circ} 28' \text{ W.}$) for the first time plenty of Kittiwakes could be seen beside those following the ship; also an immature Lesser Black-back (?) and a small Skua (Arctic?) harrying Kittiwakes. About 12.30 p.m. a more or less mature Gannet followed close astern and 2-3 Auks (? sp.) were seen flying later in the distance. On 19th ($50^{\circ} 1' \text{ N.}$, $2^{\circ} 36' \text{ W.}$) at 8 a.m. off Start Point, Devon, there were many Herring-Gulls, Kittiwakes (now in a minority), 2-3 adult Lesser Black-backs, some Gannets, and fairly frequent small parties of Guillemots.

SPECIFIC NOTES.

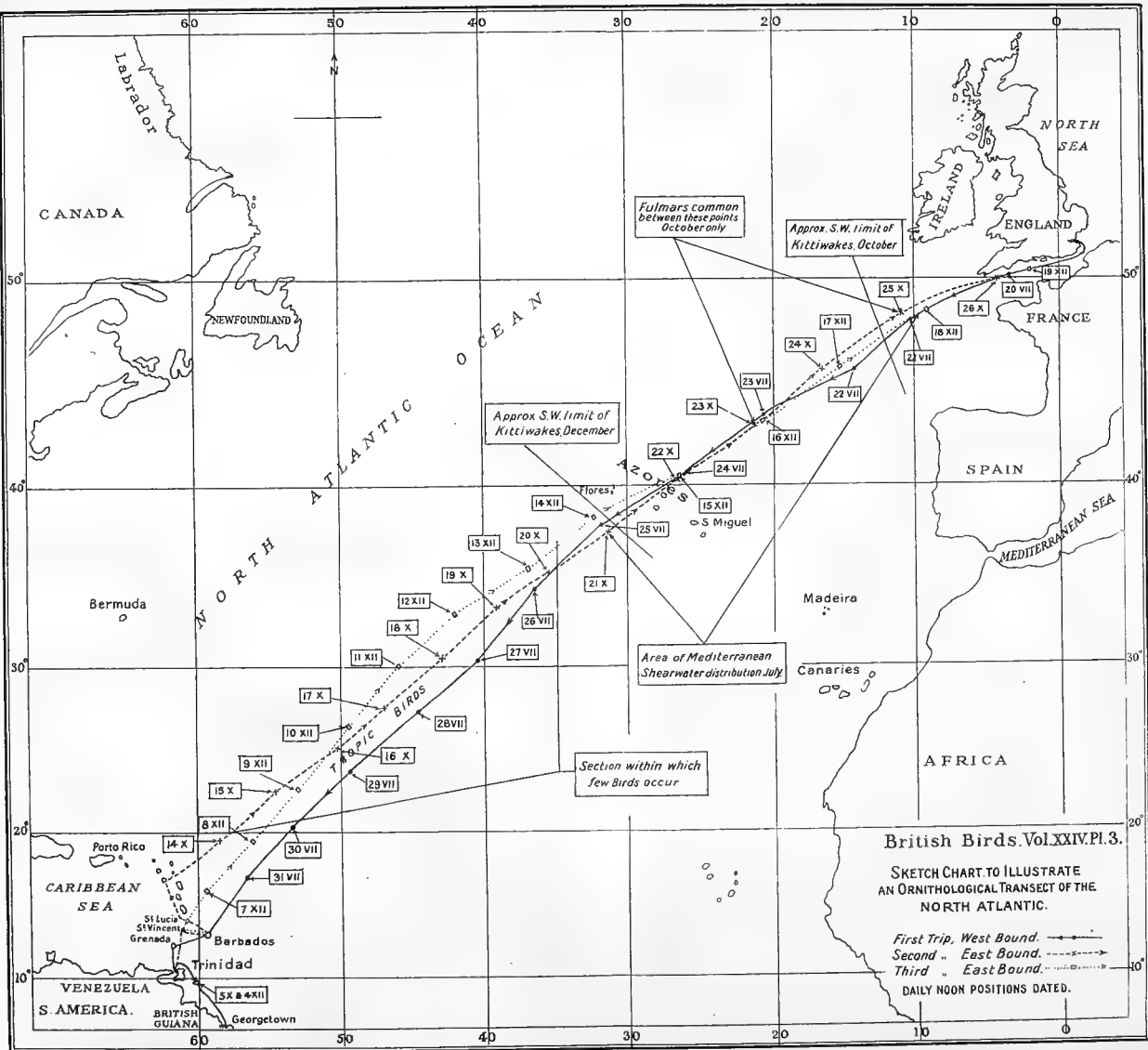
GANNET (*Sula bassana*).—Confined to the section immediately S.W. of the British Isles, and much less fluctuating in observed range than some species, extending only to about 5° W. in July and October, and to a little beyond 9° W. in December. Change in age distribution very marked: in July 12 to 1 immature, in October 5 to 1 adult. No doubt the breeding-season accounts for this, there being no gannetry in the Channel.

BLUE-FACED BOOBY (*S. dactylatra*).—Only one met with, October 16th, in 25° N. , 50° W. (Sargasso Sea). It came over to the ship and followed astern for about half an hour, diving several times from, roughly, 40 feet above the water, and apparently making captures. The conspicuous black tail was fanned out sometimes as a rudder. The bill was yellow, with a dark patch of skin at the base; the feet black or dark blue. It was immature. Another specimen shot on the coast of British Guiana was received by Georgetown Museum at the beginning of August, 1929.

BROWN PELICAN (*P. occidentalis*).—Locally common at Grenada, St. Lucia and La Brea in Trinidad, keeping very close to shore, foraging singly or in groups with precisely the same diving technique as a Gannet, except that the plunges were not made from so high—rarely above 25 feet. They flew slowly into the wind, not quite hovering, then plunging with closed wings to no great depth and rising to swim on the surface before taking wing.

MAGNIFICENT FRIGATE-BIRD (*Fregata magnificens*).—Differed slightly in distribution from the last, occurring much farther offshore, especially on the ocean side, and proving common in the harbour of Port of Spain, where a number roosted on the rigging of an old derelict hulk—47 were counted there at 6.30 p.m. on August 3rd. Some apparently stayed there all day. They soared superbly and foraged with low, harrier-like flight, picking food off the surface by canting the wings and dipping the bill into the water.

LEACH'S PETREL (*Oceanodroma leucorhoa leucorhoa*).—A bird of the typical form came aboard apparently in Port of Spain harbour.





where it was found in the evening of August 3rd. It appeared thirsty, and was attracted by the fresh-water hose. Being unidentifiable, it was killed and skinned, and is now in the British Museum. (Collection of O.U. British Guiana Expedition, 1929.) It was a female, with feet, bill, and iris all black. Some other supposed Storm-Petrels which may have belonged to this species were observed next day by members of the expedition on the way from Trinidad to Georgetown. The nearest known west Atlantic breeding area is Maine, U.S.A.

MEDITERRANEAN SHEARWATER (*Puffinus kuhlii*).—Ranged on the first trip commonly from about 10° to 32° W., with a solitary example at 49° W. On the second, for which fewer certain identifications are available, it apparently extended from about 16° to 27° W.—a notable contraction. *P. gravis*, in very small strength, replaced it for a short time about 11° W. on this October transect. In December no Shearwaters of any species occurred on the ocean passage. The flight and habits of the two species, so far as they could be observed, appeared closely similar, but not so many parties of *kuhlii* were met as of *gravis* on the Greenland trip, the largest being a flock of 50 in about 16° W. on July 22nd, and of 80 or more on October 23rd about 21° W.

FULMAR (*Fulmarus glacialis*).—Both in July and December Fulmars were nowhere met with, but in October they occurred commonly between 23rd–25th inclusive (Long. 11° – 21° W.). It would be particularly interesting to know whether this curious movement is regular, or whether it was due to some such exceptional circumstance as the heavy November and December gales.

SEMI-PALMATED SANDPIPER (*Ereunetes pusillus*).—At 9.40 a.m. on October 14th about 19° N., 59° W., rather less than 250 miles out from Montserrat, one of these small Sandpipers was seen flying astern, sometimes alighting on the afterdeck, where it was captured and dispatched for identification. It was in a thoroughly exhausted state, very thin and with an empty stomach, but otherwise in good condition. The sexual organs were undeveloped: Iris dark brown, bill and feet black. The skin is in the Expedition's collection in the British Museum.

PURPLE SANDPIPER (*Calidris maritima*).—The example which came aboard about 4 p.m. on December 14th, when the ship was 62 miles from Flores, the nearest land, was remarkably plump and tame. It looked tired, and the gales experienced farther north and east at this period might have driven it off its course.

KITTIWAKE (*Rissa tridactyla*).—In July no Kittiwakes were seen. In October they occurred not very commonly from off the Lizard to about 12° W., with a solitary immature at about 22° W. In December the first immature was met beyond 37° W., a party of five was met west of the Azores, and numbers rose steadily from then on to Start Point, immatures being always in a minority.

LAUGHING GULL (*Larus atricilla*).—Although a fine adult and a probable immature of this species were seen on July 30th more than 400 miles off Barbados, none were met with on the ocean crossing in either October or December. They were fairly local in the West Indies, and not seen far off shore, the east coast of Trinidad being their most conspicuous haunt.

HERRING-GULL (*L. argentatus*).—Although 5 Herring-Gulls were seen on October 23rd in the region of the Azores (22° W.) and another of this species or *L. fuscus* had been observed still closer to them the day before, the Kittiwake was the only Gull which occurred at all freely on the crossing outside the British seas.

SUMMARY.

In three crossings of the Atlantic along the same route between London and the West Indies in July, October and December, 1929, precise notes were kept of birds seen, and sample counts taken. As compared with a previous crossing farther north to Greenland the number of species and individuals was found to be low, even between the Azores and the Channel. The existence between the Azores and Barbados of a vast almost birdless region confirms the experience of previous observers. Remarkable fluctuations in abundance and distribution of the Kittiwake, Fulmar and Mediterranean Shearwater at these three seasons throw light on movements which may be of annual occurrence and which it is important to define by observations which could easily be repeated on the same lines at other seasons and in other years. From the standpoint of migration of non-oceanic forms the July trip was the poorest, with 3 or 4 Gulls and Terns, while the October trip was the richest, with two Sandpipers and at least two small passerines at considerable distances from land. Of these unfortunately only one specimen, a Semipalmated Sandpiper, could be specifically identified. Various Gulls were also met with. In December a Purple Sandpiper off the Azores was the only notable non-oceanic bird. References to literature are not given, the intention of the writers being to review the subject, which is in a very scattered and confused condition, in a subsequent paper.

OBSERVATIONS AT SEWAGE FARMS AND RESERVOIRS, 1930.

AUTUMN PASSAGE ON A CHESHIRE SEWAGE FARM.

By T. A. COWARD.

FROM July until December, 1930, I visited the Altrincham sewage farm every few days, and Mr. A. W. Boyd paid frequent visits, so that we were able to compare notes. From the middle of July onwards, Dunlins, Ringed Plovers and Redshanks were present in varying numbers, as were Lapwings, Snipe and Black-headed Gulls. Occasionally Lesser Black-backed, Herring- and Common Gulls passed. Migration reached its height in the third and fourth weeks of August; on August 22nd the largest number of individuals and greatest variety of species was noted. Ringed Plovers (*Charadrius hiaticula*) were most numerous between August 20th and 27th; on different days we counted from thirty to forty-four birds. Redshanks (*Tringa totanus*) often numbered from sixty to a hundred, and early in December there was a marked movement; on December 6th Mr. Boyd estimated their strength as between 130 and 150. Snipe (*Capella gallinago*) were very variable in number, sometimes very numerous and on other days hardly any were visible; I saw but a single Jack Snipe (*Lymnocyptes minimus*), a bird which I nearly trod upon on October 3rd. Common Sandpipers (*Tringa hypoleucos*), too, were unusually scarce.

Two Curlew-Sandpipers (*Calidris testacea*) appeared on July 31st and remained at any rate until August 5th, and on August 22nd a party of ten were on one tank. Others were present on September 10th and 27th, six on the later date. Ruffs and Reeves (*Philomachus pugnax*) and Green-shanks (*Tringa nebularia*) began to appear in the third week of August, and though never more than three or four together were present throughout that month and September, I did not see either species in October, but a single Reeve was about from November 2nd to the 9th. On August 17th and 22nd Mr. Boyd saw a Spotted Redshank (*Tringa erythropus*), but though I was there on the 16th and on the 22nd I failed to find it amongst the numerous Common Redshanks.

On September 27th Mr. Boyd saw a Grey Plover (*Squatarola squatarola*), a bird I have seen on the farm only in winter. A feature of the season was the occurrence at intervals of flocks of Golden Plover (*Charadrius apricarius*), birds which, though regular visitors to fields in the neighbourhood, seldom feed on the tanks.

Throughout the whole season there was hardly a day when no white-rumped Sandpipers were disturbed. As a rule these were feeding in one or two favoured spots, either close

to the turf banks which bound the tanks or in one corner which is sheltered by trees. Most of these birds, always nervous, got up before we had time to get a good view or too far away to hear their calls; probably most were Green Sandpipers (*Tringa ochropus*), but amongst those that we saw well or heard distinctly were more Wood-Sandpipers (*T. glareola*) than I have ever known to visit the farm in former years. Four on July 31st and August 2nd I thought were Woods, but four on August 9th were Greens. On the 12th, however, twelve birds were on the tanks, and of these two were undoubtedly Woods and two Greens; the remaining eight went away too soon. On the 22nd Mr. Boyd and I were on the farm at different times; he saw seven Greens and three Woods, but I saw only two Greens and one Wood, but on the following day, again at different hours, we each counted five Greens and two Woods. After September 3rd, when I saw two Wood-Sandpipers, Greens were usually present until November 31st, but I saw no birds that suggested the smaller species.

Black Terns (*Chlidonias niger*), though they visit the neighbouring meres with regularity, seldom appear on the farm, but this autumn the passage was large. The first bird was there on August 2nd, on the same day that I saw one on Rostherne Mere, four miles to the south. On August 19th eight, in various plumages, some still very black about the head, were over the tanks; on the 20th seven were counted, but on the 22nd seventeen were beating to and fro over one tank. The reduction in numbers was rapid—five only visible on the 23rd, four on the 24th, three on the 26th and one alone on the 27th. On the 22nd and 23rd many of these birds rested on the sludge, head to wind, for many minutes at a time. A single young bird was present on October 11th, but none was noticed during September.

Ducks often visit the tanks, Teal (*Anas crecca*) being the most numerous during daylight; Mallard (*A. platyrhynchos*), sometimes in large numbers flight from the meres, where they spend the day, to seek food on the sludge, but it is seldom that more than one or two are put up during the day. On several days Shovelers (*Spatula clypeata*) were present; on September 27th Mr. Boyd saw a Pintail Duck (*Anas acuta*), and on October, 3rd I put up three Pochards (*Nyroca ferina*).

On the morning of November 2nd, 1930, Mr. A. W. Boyd saw a Bewick's Swan (*Cygnus b. bewickii*) arrive at the Altrincham sewage farm and alight on a tank near two Mute Swans which were seeking food in the sludge. I went down in the afternoon, but the Mutes were alone. On the 3rd Mr. T. Baddeley and I first visited the farm and found

that the Mutes had departed, then went on to Rostherne and Tatton Meres. On the latter mere, where there were a number of Mute Swans as usual, we saw four Swans at the far end, swimming apart from the Mutes, and found that they were three adult and one immature Bewick's Swans. The patch at the base of the bill varied in shade: in two of the birds it was lemon-yellow, but distinctly more orange in the other old bird. The young bird, drabish-grey in general plumage, had the base of the bill white, the proximal portion slightly fleshy, and the distal part, which is black in the mature bird, was mottled pink and black. They seemed to be tired, for though nervous when we walked along the bank they drew off as far as the width of the mere allowed, and putting their heads and necks on their backs all went to sleep.

NOTES FROM STAFFORDSHIRE RESERVOIRS.

By A. W. BOYD.

THE following observations were made at the most westerly of the large Staffordshire reservoirs and at Gailey Pool during the twelve months ending in September, 1930. Except where it is definitely stated, all records refer to the former reservoir.

BEWICK'S SWAN (*Cygnus b. bewickii*).—I saw two on each visit from December 8th, 1929, to February 15th, 1930. They occurred in two previous years—1923 and 1925 (*antea*, Vol. XVII., p. 140, and Vol. XIX., p. 234).

DUCK, as usual, were present in large numbers, though perhaps not quite so plentiful as in some winters.

GADWALL (*Anas strepera*).—Seen annually from 1923 to 1928 were absent for the second consecutive year.

GARGANEY (*Anas querquedula*).—It was interesting to see this species again in August for the third consecutive year (*cf. antea*, Vol. XXIII., p. 237). On August 9th there were two, one of which we saw especially clearly in flight and on the water. Again, on August 24th, I watched one flying with two Shovelers, duck with which it seems they are wont to associate.

TEAL (*Anas c. crecca*).—At their maximum—several hundred—in December and January, but only a few score left in February; and though a few were present throughout the summer, by September 23rd not more than twenty or thirty had returned.

WIGEON (*Anas penelope*).—Until the second week of February they numbered some 500, but they had fallen to 200 or 250 by the end of March, and on April 13th only fifteen to twenty were left.

PINTAIL (*Anas a. acuta*).—Occurred twice only: three—

one an adult drake—on February 15th, and an adult drake, which had become slightly mottled on the side of the neck, on June 16th. The latter is, of course, a most unusual date, but the bird flew strongly enough and showed no sign of having been wounded and delayed beyond its time; I certainly did not see it during visits in March and April.

SHOVELER (*Spatula clypeata*).—Far scarcer than normally though seen in small numbers in June, August and September as well as in the earlier months of the year.

POCHARD (*Nyroca f. ferina*).—Also less plentiful than usual, though present on the reservoirs on the occasion of every visit throughout the year; 166 at Gailey Pool on December 8th were the largest group seen.

TUFTED DUCK (*Nyroca fuligula*).—Never exceeded 100 on either reservoir. On August 9th there were forty or fifty adults and at least three broods of youngsters.

GOLDENEYE (*Bucephala c. clangula*).—Distinctly less plentiful than before; at no time were more than nine or ten seen (March 29th) and the latest were three on April 13th. In the group of nine or ten, two drakes, an old bird and a younger one, displayed a little by swinging back their heads, but a far better display by a solitary adult drake was seen on the same day (March 29th) at Gailey. The display was the usual violent swing back of the head over the tail, accompanied on each occasion by a kick out behind and a splash—bringing its orange-coloured legs out of the water. There was no other Goldeneye on the water, so that the display cannot have been intended as an attraction to the female, nor as an act of rivalry to another male. The bird passed two Tufted Ducks, but paid no attention to them and did not stay near them.

GOOSANDER (*Mergus m. merganser*).—Seen on five days only. Mr. E. Cohen saw ten at Gailey on February 9th, six of which were drakes; on February 15th I saw five there. The last in the spring were one or two on March 29th.

SMEW (*Mergus albellus*).—Mr. E. Cohen saw an adult drake at Gailey on February 9th.

CORMORANT (*Phalacrocorax c. carbo*).—On August 24th I watched one struggling with an eel and later saw it rise and fly right away. It is strange that I have never seen a Cormorant there before.

GREAT NORTHERN DIVER (*Colymbus immer*).—On December 8th, 1929, I watched one at close quarters on Gailey Pool and it was still there on December 28th.

GREAT CRESTED GREBE (*Podiceps c. cristatus*).—Always plentiful throughout the year—more than fifteen on January 4th. One was sitting on a nest in the lake at Stretton as early as April 13th.

BLACK-HEADED GULL (*Larus r. ridibundus*).—Seem to be rather more regular in appearance than they were a few years ago and from thirty to forty were to be seen on each visit from December to mid-April.

LESSER BLACK-BACKED GULL (*Larus f. grællsii*).—I saw two passing at Stretton on March 29th.

KITTIWAKE (*Rissa t. tridactyla*).—My wife and I watched an adult bird for a long time on March 29th. Unlike storm-driven birds I have seen inland before, it seemed to be perfectly strong on the wing and spent most of its time flying up and down over the reservoir with the easy flight they display over the ocean.

This is the first Kittiwake I have seen during numerous visits to Staffordshire reservoirs since 1922, though I have always examined critically every Gull that has appeared. Mr. F. Coburn, in the *Transactions of the N. Staffs. Field Club*, Vol. XLIV. (1909-1910), among other records, notes that "this pretty Gull must be regarded as a common and regular visitor" (cf. *British Birds*, Vol. IV., p. 111). It is clear either that Mr. Coburn was generalizing from a particular case or that the Kittiwake ceased to pay its accustomed visits to Staffordshire between 1910 and 1922.

TERN (*Sterna* sp.).—On September 23rd there were six white Terns—Common or Arctic—in winter plumage fly-catching over the water.

BIRDS AT SOUTH STAFFORDSHIRE SEWAGE FARMS.

By F. FINCHER.

THE following notes on the scarcer species that I have found during 1930 mainly at the Walsall and West Bromwich sewage farms in south Staffordshire may be of interest. Both these farms lie very close to each other, but on opposite sides of the upper course of the river Tame and a large railway junction.

WHITE WAGTAIL (*Motacilla a. alba*).—Two at Walsall sewage farm on August 17th at the same place as previously reported on May 1st.

NIGHTINGALE (*Luscinia m. megarhyncha*).—One at Walsall sewage farm on August 10th was the first I have seen in Staffordshire.

RINGED PLOVER (*Charadrius h. hiaticula*).—Two on August 21st and one on September 21st at West Bromwich sewage farm.

GOLDEN PLOVER (*C. apricarius*).—One flying over Walsall sewage farm on September 7th and another was seen on November 9th amongst a large flock of Lapwings a little further down the Tame valley.

DUNLIN (*Calidris alpina*).—One seen at West Bromwich

sewage farm on August 21st and several on September 14th.

PURPLE SANDPIPER (*C. m. maritima*).—Four or five at least (possibly more, but some Snipe flew up with them) were seen at Walsall sewage farm on October 2nd. One turned back and pitched within six yards of me and I was able to observe and note down its characteristics, including small white marks round the eye, its dark bill with orange base and its dull orange legs.

COMMON SANDPIPER (*Tringa hypoleucos*).—Four at West Bromwich sewage farm on August 4th and the call was again heard there on August 14th.

GREEN SANDPIPER (*T. ochropus*).—One at a pool near Tipton on May 12th, one at another pool near Tipton on July 31st, three at a pool close to the West Bromwich sewage farm on August 10th, and four on Wolverhampton sewage farm on August 24th.

COMMON REDSHANK (*T. totanus*).—Six on March 23rd at Walsall sewage farm, and from then up till October 16th I found some nearly every time I visited the spot, especially during May. I think one pair at least remained to nest.

BAR-TAILED GODWIT (*Limosa l. lapponica*).—Two at West Bromwich sewage farm on September 14th. They were still in the chestnut plumage.

BLACK-TAILED GODWIT (*L. l. limosa*).—One at West Bromwich sewage farm on September 14th. One of the Bar-tailed Godwits frequently walked quite close to this bird and thus gave me a good chance to judge the superior size and length of leg of the Black-tailed Godwit. Among other characters I noted the white upper tail-coverts and the black end of the tail, while in flight a light band showed across the flight-feathers. Mr. Masefield tells me this is the second record for Staffordshire and the third bird observed in the county.

CURLEW (*Numenius a. arquata*).—Three over West Bromwich sewage farm on October 5th and one flying round quite low over Walsall sewage farm on October 16th.

MIGRATION AT CAMBRIDGE, AUTUMN, 1930.

By DAVID L. LACK.

THE following general notes on migration at Cambridge this autumn emerge from the almost daily observations of members of the Cambridge Bird Club at the Sewage Farm during the period.

A flock of Lapwing (*Vanellus vanellus*) appeared on May 31st, numbering sixty by June 5th. A party of Redshank (*Tringa totanus*) arrived on June 8th, totalling seventeen on June 13th and over forty on July 8th, after which they decreased. In the *Practical Handbook* the former species is

said to begin to leave its breeding haunts in July and the latter to commence its autumn passage in mid-July. However, the markedly earlier dates obtained at Cambridge this year were also obtained for both species at Scolt Head, Norfolk, by Miss E. L. Turner in 1924 and 1925 (*Bird Watching on Scolt Head*, p. 67).

By July 8th a few Dunlin (*Calidris alpina*), Common Sandpiper (*T. hypoleucos*) and Green Sandpiper (*T. ochropus*) had already arrived. The first Ringed Plover (*Charadrius hiaticula*) came on July 10th, there being eight on July 24th and over twenty on August 10th. The *Practical Handbook* states that the last species commences its autumn passage in mid-August, a month later than the first birds arrived in Cambridge, but it must be noted that until August 3rd the passage was mainly of non-breeding birds. Counts of those present on six days between July 10th and August 2nd gave only six birds in breeding-plumage out of twenty-three counted (the first came on July 20th). Most, if not all, those birds not in breeding-plumage were presumably non-breeding (some, perhaps, young of the year). From August 3rd adults preponderated. Seven counts between then and August 14th gave 119 birds in breeding-plumage out of 145 counted, indicating that most of the adults migrate before the young.

As information on the last point seems to be incomplete for most waders the following may be of interest. In Dunlin, birds in breeding-plumage exceeded in numbers those not in breeding-plumage from July 8th until at least August 10th. Counts on six days between July 15th and 29th gave 171 birds in breeding-plumage out of 202 counted. In the following, all seen prior to August 17th were in breeding-plumage: two Golden Plover (*Ch. apricarius*), four Turnstone (*Arenaria interpres*), one Sanderling (*Crocethia alba*) and six Curlew-Sandpiper (*Calidris testacea*). In all these species the first birds to arrive, excluding a few non-breeding birds, seem to be adults, preceding the bulk of the young which come in September.

In the Black-headed Gull (*Larus ridibundus*) the sequence appears to be similar. In mid-June there were about forty non-breeding birds (most probably in their first summer), in mid-July a flock of one hundred and fifty, almost all of which were adults, then a period with few birds, and then in the second week of August a flock of about five hundred, almost all young of the year.

The direction taken by the migrants in spring (*antea*, Vol. XXIV., p. 148) was confirmed by observations in the autumn. *Hirundines*, Waders, Terns, Gulls and a Cormorant (*Phalacrocorax carbo*) were all found to leave, or fly straight over, between south and west, but the precise direction

varied considerably between these limits. At Tring, which is south-west of Cambridge, Mr. C. Oldham records migrants taking the same course (several instances in *Trans. Herts. Nat. Hist. Soc.*, Vol. XVIII., part 4, and other numbers). It seems probable that Cambridge receives many of those waders and some other birds which pass west along the Norfolk coast in autumn and have so far only been traced to the Wash, which lies nearly north-east of Cambridge. In connexion with this, it is perhaps worth noting that on October 19th Mr. C. W. Benson and I witnessed a large arrival of Rock-Pipits (*Anthus s. petrosus*) off the sea at Scolt Head, Norfolk, and the next day there were six at the Sewage Farm.

On August 16th, a hot day, Ringed Plover, both adults and young, were repeatedly chasing each other along the ground and uttering the courtship note. As in spring, waders were at times seen during the day in an excited state, and these subsequently resumed migration. There was another form of excited display peculiar to the late evening. One individual would repeat the normal note insistently and forcibly, another would take it up and the excitement would spread generally, reach a climax and die down. Such a display perhaps precedes migration, but no evidence was obtained for this, and the calling was quite different from the hoarse, almost hysterical variation of the normal note uttered by birds preparatory to migrating during the day.

During the autumn twenty-three species of wader were seen at the Sewage Farm. On August 12th alone there were fourteen. Specially noteworthy is the occurrence of another Temminck's Stint (*Calidris temminckii*) from August 2nd to 6th, seen by Mrs. Brindley, Miss E. L. Turner, myself and others. So far as I know, this species has not been recorded inland in England for sixty years, save for the spring record at Cambridge this year.

The other species seen have all been recorded not infrequently from other sewage farms and reservoirs, but a Purple Sandpiper (*C. maritima*) occurred by a dyke on a fen four miles from Cambridge on November 23rd and 24th. There was an influx of Dunlin about a week later, and perhaps both these arrivals should be considered as cold weather movements and not true autumn migration, although Cambridge itself experienced no marked weather changes at these times. In any case they are yet further examples of the frequency with which typically coastal waders take an inland route. There appear to be very few records of the Purple Sandpiper being observed inland in England, and the above is the first for Cambridgeshire.

THE BIRTH OF A BLACK-HEADED GULL.

BY

F. B. KIRKMAN.

I. INTRODUCTORY.

MUCH has been written about the development of the bird inside the egg, its embryonic life, but of its manner of exit from the egg little is known, and this little chiefly concerns the domestic hen and the domestic pigeon. For the most complete account of the birth of the former we have still to go back to Réaumur's *Oiseaux Domestiques* (Mémoire VI.), of which the first edition was published so long ago as 1749. An abstract in English of his results will be found in an interesting little book published in 1833, the *Domestic Habits of Birds*, by J. Rennie. Réaumur's observations have been supplemented in recent times by Mr. F. S. Breed.⁽¹⁾ If to these be added Mr. W. A. Craig's notes on the Pigeon (*T. nisorius*),⁽²⁾ we appear to have exhausted the literature of the subject as far as domestic species are concerned. Of the hatching of wild species there is no detailed account. But W. H. Hudson and another observer have left us short but interesting notes to which we shall return.

What follows relates to the chick of a wild species I have studied for several years, the Black-headed Gull (*Larus r. ridibundus*), the commonest of the Old World sea-birds. Its exit from the egg divides into two phases of which the first is the making of a breach in the shell.

II. FIRST PHASE.

If towards the end of the third week of incubation the eggs in a Black-headed Gull's nest be examined, there will be found on the surface of one of them an area of light cracks. This area extends until it occupies about a quarter of the circumference of the shell at its bigger end. If the egg is put to the ear a rhythmic tapping is clearly audible. The rhythm varies from single taps to double, and some are stronger than others, but the impression left on the mind is that the process is automatic, like pulsation. One hears also a repeated cheeping, which makes it evident that the chick has already penetrated the inner shell membrane dividing it from the air-chamber provided by Nature at the bigger end of

⁽¹⁾ *Instincts and Habits of Chicks*, 1911-12 in the *Behaviour Monographs* published by Holt.

⁽²⁾ *Journal of Animal Behaviour*, II., 1912, 296-8.

the egg, and that it has begun direct lung breathing. After thirty or forty hours or so the persistent tapping on the inner surface results in a small, clean-cut hole being drilled somewhere in the cracked area (Fig. 1). I have records of it in the centre, on the right-hand, on the left-hand, and towards the top. Through this hole the tip of a moving beak is visible.



FIG. 1. Chick of Black-headed Gull with egg showing first hole drilled by the egg-tooth of the chick inside.

(Photographed by F. B. Kirkman.)

After a few hours more, either a second hole is made, about half an inch to one side of the first, or else the latter is greatly enlarged (Fig. 3). If two holes, these are joined after a time by a simple fissure or split in the shell. Whichever form the breach takes it extends roughly the width of the cracked area. That suffices. The tapping ceases and the first phase ends.

That is the process regarded from outside. Let us now turn to the mechanism of the tapping regarded from inside.

It is well known that the instrument used for making a breach in the shell by all birds and also by reptiles, including

the crocodile, is the so-called egg-tooth. In birds it is a small, chalky, peak-shaped projection on the tip of the upper mandible of the beak. It appears a few days before birth, and, having performed its unique function, disappears gradually after the chick's exit from the egg. Its position on the top of the point of the beak implies that the taps are upward movements. I was not surprised, therefore, to see upward movements when I broke away the shell at the spot where the tapping occurred. The same fact has been noted by Mr. F. S. Breed in the case of the domestic chick. It is a fact that disposes of the popular notion that a bird pecks a way out of the egg in the sense of striking forward with the end of the beak. Occasional pecking movements have, it is true, been recorded. "At times", writes Mr. F. S. Breed of the domestic chick, "before the egg has been broken in two, one does see short, quick, forward thrusts of the bill, followed by working of the mandibles. And chicks, only a few hours out of the egg, may be observed repeatedly executing what might be called a pecking reaction "into the air", followed by a clapping together of the mandibles (*op. cit.*).

In the case of the Black-headed Gull chick I have heard occasional taps that had a sharper sound than the usual. These may have been made with the tip of the beak and were possibly the accidental result of the bird's movements as it shifted in the egg. Also, after the chick has effected its release, I have observed opening and closing movements of the beak which may be the same as the "pecking reaction" above described. These movements are interesting, but they have little or nothing to do with the perforation of the shell, which is obviously the function of the sharp-pointed egg-tooth.

On breaking away the shell I found not only that the movements of the beak are upward, but also, as indeed the rhythmic tapping had led me to expect, that they are automatic; they seemed to me to be clearly part and parcel of the strong pulsation of the whole body, due presumably to the onset of lung breathing and blood circulation. Each tap is one with each throb of the body. Thus the perforation of the egg is an involuntary act; the chick is not trying to make a breach; on the contrary its achievement results automatically from the pulsation of its body in the sense that this pulsation is the sole source of the motive power or energy that keeps the egg-tooth tapping on the inside surface of the shell. Whether this is true of the domestic chick,

the pigeon and of wild species generally, remains to be ascertained. If it is true it provides a remarkable solution of the problem of exit, a solution achieved by the utilization of the throbs of the chick's body as power to drive a highly specialized tool, the egg-tooth, supplied by Nature *ad hoc*.

The first phase of the Black-headed Gull's exit ends when it has made a fissure in the shell extending about a fourth of the way round the larger end of the egg. Herein it differs from the barn chick and duckling; also from the pigeon observed by Mr. Craig.⁽¹⁾ All three extend the line of cracks nearly round the circumference, the direction, as noted by Réaumur in the case of the barn chick, being from left to right: "il fait sur son propre corps une révolution de gauche à droite." It does this also in the rare cases when the fore-end of its body is lodged in the small end of the egg. The Black-headed Gull appears to proceed in either direction, that is to say, I have found the second hole it perforates either to right or left of the first (Fig. 3). The distance it moves is, of course, relatively small.

Réaumur asked himself whether the chick shifted round from left to right with the aid of its beak or its legs. He assumed it must be one or the other. As he could not devise any way of determining the part played by the legs he turned his attention to the beak. He removed the shell along a portion of the line the beak was to travel, thus ensuring that it would strike air. If it struck air only, and the chick still progressed to the right, then the inference would be that the beak played no part in its progress. Both the two chicks experimented with progressed beyond the prepared fracture and proceeded with its extension. Réaumur concluded that the turning was effected by the legs. He is probably right, but there is the possibility that the arms are involved. A final question not so far formulated is: What is the stimulus that impels the chick to effect this movement? There is at present no answer.

III. THE SECOND PHASE.

The second phase in hatching lies between the completion of the work of the egg-tooth and the final exit. During this phase the Black-headed Gull chick is making periodic thrusts, the effect of which is to push the big end of the shell outward by extending the crack both ways. What is the mechanism of these thrusts?

⁽¹⁾ *Journal of Animal Behaviour*, II., 1912, 296-8.

If one examines the chick in the shell one finds that it is in a very curious position. It lies with its head and the fore-part of its neck tucked under the body, its throat facing its stomach, and not only so, but the head is, as it were, bolted into place by the beak, which passes upward between the right arm (wing) and the side of the breast. This position I found, after making my investigation, corresponds exactly to Réaumur's description of that of the domestic chick "Il est presque mis en boule ; son col en se courbant descend du côté du ventre, vers le milieu duquel sa tête se trouve placée ; le bec est passé sous une des ailes ; . . . cette aile est constamment l'aile droite . . ."

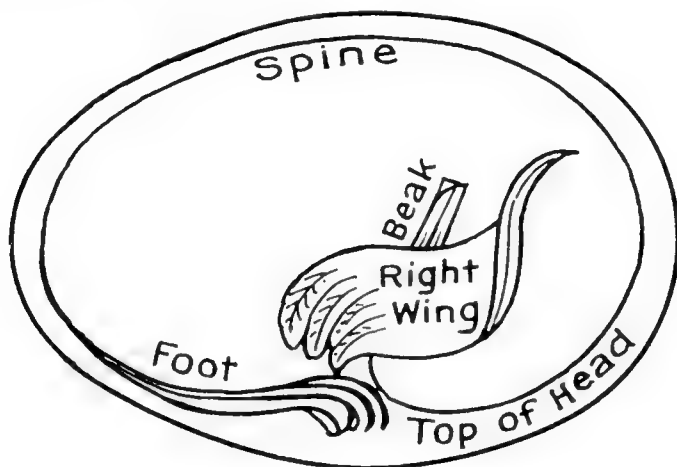


FIG. 2. Diagram showing position of the chick in the egg before hatching. The egg-tooth is indicated on the upper tip of the beak.

The effect of the Black-headed Gull chick's position is that its spine forms an arch supported at one end on the legs and at the other on the back of the neck and head, as shown in the diagram (Fig. 2), which corresponds generally to those of Réaumur. The thrusts appeared to me to be upward thrusts of the spine, and it is easy to understand that they are very powerful, seeing that they have behind them the double leverage of the muscles of the legs and of the back of the neck. According to Réaumur the domestic chick thrusts the body forward, not upward, and it does so by means of the legs. This one would expect, for it has not, like the Gull chick, to extend the crack round the shell, but only to push out of the way a cap or lid already nearly detached from the body of the egg.

Here again, as in the case of the taps of the egg-tooth, there is reason to think that the achievement of release from the egg is not what moves the chick to action. Its movements at this stage seem to be directed solely to the more immediate object of freeing its head, the physical stimulus being no doubt supplied by the increasing squeeze of the head between the growing body on the one side and the inside of the shell on the other.

The first act in the process of release may be called that of unbolting; in this, the Black-headed Gull chick, after long efforts, manages to withdraw its beak from between the wing and the flank. Here one may well demand what purpose this peculiar position of the beak serves. It probably adds force or backing to the upward tapping of the egg-tooth, for this, of itself, can hardly be very effective. Réaumur goes further and suggests that the blows are guided by the wing and body.

Once the beak is released, the withdrawal of the head from under the body is relatively simple. It is effected by a sudden and violent jerk, extremely difficult to follow; one moment the head and neck lie pressed between the chick's under-parts and the shell; next moment they are stretched out in front, and the exit from the egg is thereby practically completed. No such sudden or violent movement was observed by Réaumur of the domestic chick: "it draws its head from under the wing, stretches out its neck . . ."

The exit, as far as the Black-headed Gull is concerned, is not the end of the tale. When quite clear of the egg the chick still continues periodically to repeat the thrusting movements, though their purpose has been realized. The movements are now easily observed: both the powerful arching of the spine, which seems to some extent independent of the leverage of its supports, and also the upward push of the legs. A few of the thrusts ended in the chick visibly moving *backward* an appreciable distance; these may represent what takes place in the egg when the head is released, with the difference that the backward movement being met by the narrow end of the shell, there is only enough regression to facilitate the pull of the neck and head from under the front of the body. Occasionally I have seen the chick, when lying in my hand, get its head again under the body, and again free it by an instantaneous jerk, still difficult to follow. These post-natal movements go on for some time. I have noted their occurrence not less than three-quarters of

an hour after exit. They provide an interesting example of a reaction taking place, though its external stimulus has ceased to be operative, and continuing to do so, apparently in response to some periodic internal stimulus. It is, throughout the process of birth, this question of stimuli that calls for investigation.



FIG. 3. Black-headed Gull's nest with two eggs, one of which shows two holes made by the egg-tooth of the chick inside.

(Photographed by F. B. Kirkman.)

The whole process from the first light network of cracks to the final exit takes about forty-eight hours, a figure that is a rough approximation only, for I was unable to get exact estimates. The period varies, no doubt, from chick to chick. According to Réaumur the time between the making of the first hole by the domestic chick and its exit varies from one to forty-eight hours! Some chicks, he says, work continuously, others intermittently. He ascribes this in part to variations in the thickness of the shell. A shell may in

fact be so thick as to be impenetrable by the egg-tooth ; the egg becomes the chick's tomb.

IV. CONCLUDING REMARKS.

It would be of great interest to have records of the hatching of chicks of other wild species. That they will show considerable differences is likely. An indication of this is provided by a fact related by W. H. Hudson,⁽¹⁾ to which allusion has already been made. He was holding in his hand an egg containing a chick of a South American Jacana (*Parra jacana*), an aberrant species of Plover, and therefore a member of the same Order as that of the Gulls. The shell was already chipped. All at once the egg parted, and at the same moment the young bird "leaped" from his hand and fell into the water, where it at once began to swim. On reaching land, it hid itself in the grass. Here we get behaviour strikingly different from that of the domestic chick and the Black-headed Gull. Neither of them would be capable of such activity for some time after their release from the egg.

Hudson thought that the baby Jacana's sudden exit was the effect of the anxious screaming of its parents. This is doubtful, judging from a somewhat similar incident recorded by Mr. R. T. Moore in the *Auk* (1912, 218). It relates to another species of Plover, the Least Sandpiper (*Calidris minutilla*), found nesting by him on the Magdalen Isles, in the Gulf of St. Lawrence. The bird he had under observation was so tame that it pushed its way on to the nest under his hand. He removed it, and it was then that one of the eggs hatched. "It broke open violently, as if by explosion, the two sections shooting to opposite sides of the nest." The chick celebrated its exit by a vigorous exercise of its wet arms (wings), one of which, striking the smaller section of the egg, sent it flying. Further activity was suppressed by the returning parent bird, which proceeded to brood.

We have here, as probably also in the case of the Jacana chick, an apparently normal hatch. What distinguishes both Plover chicks from those of the barn-fowl and the Black-headed Gull is their greater precocity ; they are born with a greater freedom and strength of limb. Such precocity is still more marked in the chicks of some other species, for example of the Megapodes or Mound-builders. These are left to hatch from eggs buried in mounds of earth and leaves ; they are feathered at birth, and able to fly almost

(¹) *Naturalist in La Plata*, Ch. VI.

immediately after pushing their way out of their novel incubator.

What makes the manner of exit of the two Plover species seem abnormal is its suddenness; but this suddenness becomes intelligible if regarded as an effect of the precocity. It is more than probable that the degree of precocity of the nestling at birth is the main factor determining specific differences in the hatching process. The maximum difference will be between the most precocious and the least precocious, the latter represented by species whose chicks issue from the egg quite helpless and remain so several days. It is from a comparison of the extremes, and not from further investigation of intermediate forms, that the most striking results are likely to be obtained—a statement which must not be taken to suggest that there is not still a vast amount to be learned from the hatching of any species.

NOTES

LATE WHEATEAR IN DURHAM.

ON November 27th, 1930, we saw a Wheatear (*Enanthe aenanthæ*) at Sadberge, co. Durham. This is such an exceptionally late date that it seems worthy of special record.

M. G. ROBINSON.

W. E. ALMOND.

NORTHERN GREAT SPOTTED WOODPECKER IN DURHAM.

ON January 2nd, 1931, a Great Spotted Woodpecker was brought to me in the flesh which appeared to be slightly larger than usual, and upon taking the bill and wing measurements I found that this bird was of the Northern form (*Dryobates major major*). It was shot at Winlaton Mill, co. Durham, on January 1st, 1931. The sex was not determined owing to shot wounds, but the plumage was that of an adult female. The specimen has been submitted to Mr. Witherby, who confirms the identification.

S. E. COOK.

RINGED BIRDS IN PELLETS AND NESTS OF OWLS AND HAWKS.

LITTLE OWL.

THE examination of Little Owls' (*Athene n. vidalii*) nests has shown the value of bird-ringing for reasons other than the original desire to trace migration and distribution.

The contents of three nests at Frandley, near Great Budworth, Cheshire, were as follows:—

- (i.) May 21st, 1929.—In a nesting-box containing two eggs was a freshly killed Yellowhammer (*Emberiza c. citrinella*) lacking head and neck and bearing ring H.3878, which I had put on an adult near by on January 22nd, 1929.
- (ii.) June 21st, 1930.—In a hollow oak-bough containing young were bones of frog and vole, jaw of field-vole, elytra and other remains of the beetles *Geotrupes stercorarius* L. and *Geotrupes spiniger* Marsh, and also the living beetle, *Trox scaber* L., an insect often found in nests in hollow trees; the flea *Ceratophyllus gallinæ* Schrank was also present. Only a small part of the contents of this nest could be examined.

(iii.) July 19th, 1930. This nest was built on the top of an old Starling's nest of the previous year in a nesting-box and was completely removed for examination.

It contained many feathers and remains of birds, and rings from the following:—

Tree-Sparrow (*Passer m. montanus*).—F9053 ringed on May 20th, 1928.

Hedge-Sparrow (*Prunella m. occidentalis*).—D3225 ringed on October 6th, 1925.

Song-Thrush (*Turdus philomelus*).—W5433 ringed on December 18th, 1927. These three birds were all ringed within a few hundred yards. The following insects were found:—

The beetle *Barynotus mæreus* Fab. and other beetles; the common Tineid moth, *Borkhausenia pseudopretella* Staint., which doubtless had bred in the nest; and the flea *Ceratophyllus fringillæ* Walk.

Two snails *Cochlicopa lubrica* and *Pyramidula rotundata* were probably associated with the old Starling's nest.

Mr. H. Britten, of the Manchester Museum, most kindly helped to examine the nests, and named the contents.

A. W. BOYD.

A Song-Thrush (*Turdus ph. clarkei*) ringed Z8280 by L. E. Taylor just before leaving the nest in May, 1924, at Pyrford, Surrey, was found in April, 1925, in the nesting-hole of a Little Owl in the next field to that in which it was ringed.

E. P. LEACH.

TAWNY OWL.

Among the contents of a number of castings of the Tawny Owl (*Strix a. sylvatica*) picked up at Frandley, nr. Great Budworth, Cheshire, on March 30th and April 3rd, 1930, was a ring, H4046, which I had put on a Robin (*Erithacus r. melophilus*) on March 8th, 1929, a few hundred yards away.

Mr. B. J. Marples, who kindly examined the pellets for me, found also in them the remains of three long-tailed field-mice, three short-tailed field-mice, two young rabbits, four shrews of some species, five common frogs and two beetles (*Geotrupes* sp.).

A. W. BOYD.

A Starling (*Sturnus v. vulgaris*), ringed 14902 as adult by N. H. Joy in October, 1911, was found freshly killed in a

Tawny Owl's larder at Bradfield, Berks., in May, 1912, at the same place where it was ringed.

Another Starling, ringed 19205 as a nestling by N. F. Ticehurst in May, 1912, at Tenterden, Kent, was found in the same place in May, 1913, in a Tawny Owl's nest, fresh and partly eaten.

A Song-Thrush (*Turdus ph. clarkei*) ringed Y5972 as a nestling by R. H. Brown in April, 1925, at Nether Welton, Cumberland, was evidently eaten by a Tawny Owl, the ring being found in the nest-hole, where the Owl was sitting on two eggs, on April 2nd, 1926. This nest was examined on March 22nd and the ring was not then present, which points to the Thrush having been full-grown when killed.

A second Song-Thrush, marked Y5969 by the same ringer at the same place, was also destroyed by the Owl, the ring being found on April 30th, 1926, in the nesting-hole.

The ring, Z8121, from a Song-Thrush marked as a nestling by C. F. Archibald at Ulverston, Cumberland in June, 1925, was found at the same place later in the year in the casting of a Tawny Owl.

PEREGRINE FALCON.

A three-year-old Song-Thrush, ringed Z5187 by H. J. Moon as a nestling at Ullswater in May, 1924, was killed by a Peregrine (*Falco p. peregrinus*) near the same place.

The leg of a Blackbird (*Turdus m. merula*) with ring W6394 was found in a Falcon's eyrie in Cumberland, in addition to thirty-two Pigeon rings. The bird had been marked by H. J. Moon at Ullswater in April, 1927, and the recovery was made in June of the following year.

A Curlew (*Numenius a. arquata*), marked as a nestling with ring 75011, near Dalston, Cumberland, by R. H. Brown in June, 1924, was killed by a Peregrine in January, 1925, in Wigtownshire, Scotland.

KESTREL.

A fresh casting from a Kestrel (*Falco t. tinnunculus*), found at Strathblane in April, 1924, contained the ring 58836 which was put on a Lapwing (*Vanellus vanellus*) at Glenorchard, Stirlingshire, in June, 1923, by J. Downie.

SPARROW-HAWK.

A Song-Thrush, ringed 7077 in June, 1910, as a nestling by A. G. Leigh at Hampton-in-Arden, Warwickshire, fell from a Sparrow-Hawk (*Accipiter n. nisus*) which a keeper

shot at. This Thrush was a three-year-old bird, still in the same place.

Another Song-Thrush, ringed 3292 as young in May, 1922, by J. Bartholomew, was killed three years later in the same place in Stirlingshire, by a Sparrow-Hawk.

The ring, V.2547, and remains of an adult Blackbird marked by A. P. Meiklejohn in Norfolk in July, 1928, were found a few days later in a Sparrow-Hawk's nest near where it was ringed.

A nestling Lapwing, ringed HN.9 in Stirlingshire by R. Dingwall in June, 1918, was reported the following year as having been killed by a Sparrow-Hawk in the same place.

A Lapwing, ringed R.8592 by E. Cohen near Bonar Bridge in June, 1930, was torn to pieces by two Sparrow-Hawks at the same place in the following September.

In a number of other cases ringed birds (4 Starlings, 1 Chaffinch, 1 Greenfinch, 3 Song-Thrushes, 1 Blackbird, 3 Lapwings and 1 Redshank) have been reported as having been killed by "hawks" of which the species is not recorded.

E. P. LEACH.

INCUBATION- AND FLEDGING-PERIODS OF BARN-OWL.

PARTICULARS were given in Vol. XXIII., pp. 274-5, regarding the fledging-period of a brood of Barn-Owls (*Tyto a. alba*). A pair of Barn-Owls (perhaps the same pair) again nested amongst the hay in an end mewstead of a barn in Cumberland during 1930. Five eggs were laid and hatched but only three young reared. The eggs were laid on alternate days and incubation began with the first egg. This was laid on April 10th, and the fifth egg on the 18th. Two nestlings hatched on May 14th, a third on the 16th, a fourth on the 19th, and the fifth on the 21st. If the eggs hatched in the order in which they were laid, then the incubation-period was thirty-two to thirty-four days.

The three surviving young left the hay and had moved on to the wall plate by July 6th, and were judged to be in juvenile plumage on the 17th, but made no attempts at flight when handled. Five more visits were paid to the young, but it was not until August 8th that they flew about the barn. The fledging-period was therefore eighty-one to eighty-six days.

R. H. BROWN.

SHORT-EARED OWLS BREEDING IN HAMPSHIRE.

IN 1928 I noted that at least two pairs of Short-eared Owls (*Asio f. flammeus*) bred on the Laverstoke Park Estate (*antea*, Vol. XXII., p. 263). These birds have now apparently established themselves in the Whitchurch-Micheldever area. In 1930 there were seven nests in one three-year-old larch plantation. When shooting there in September I saw nineteen birds, in November eleven, while in December I counted fourteen sitting on the sunny bank of an old chalk pit dell.

In May there were the remains of four Partridges at one nest which contained four young Owls. Later this nest had only two Owls and the beaks and legs of the other two, from which it would seem that the stronger had eaten the weaker. This confirms a similar observation made in 1928. M. PORTAL.

OSPREYS IN YORKSHIRE.

WITH reference to the immigration of Ospreys (*Pandion h. haliaetus*) we desire to put on record that two were seen at Low Row, Swaledale, Yorks., on October 2nd, 1930. One of these was unfortunately shot by a person ignorant of the bird's identity. It proved to be an immature bird and was examined by one of us.

M. G. ROBINSON.

W. E. ALMOND.

BLACK-THROATED DIVER IN ESSEX.

ON December 29th, 1930, I saw on the Racecourse Reservoir at Walthamstow a bird which I identified as a Black-throated Diver (*Colymbus arcticus*). On several occasions during the preceding fortnight I had had the opportunity at Staines of comparing at short ranges and in an excellent light a Great Northern and a Black-throated Diver swimming close together. Thus I had the differences of the conformation and size of the head and bill well defined in my mind when I saw the bird at Walthamstow. Two or three days afterwards, on January 1st, the identification was confirmed by Mr. W. E. Glegg.

F. R. FINCH.

SPOTTED REDSHANK IN PERTHSHIRE.

IN the beginning of September, 1930, two Redshanks were observed at Invergowrie Bay; one of these was shot on the 4th and obtained by the Perth Museum. I suspected it to be a Spotted Redshank (*Tringa erythropus*) and this was confirmed by Mr. Witherby. Unfortunately, the gonads were not sufficiently in evidence, even with a microscopic

examination, to reveal whether the bird was a male or female. In dissecting the various organs, two specimens of the nematode parasite *Acuaria obvelata* were found in the œsophagus.

JOHN RITCHIE.

UNUSUAL NUMBER OF BLACK TERNS IN CHESHIRE.

ON August 21st, 1930, I counted twenty-three Black Terns (*Chlidonias n. niger*) hawking over Marbury Mere, near Northwich, Cheshire. They seemed to show every variety of plumage: some in full plumage, others mottled, and others almost white.

I saw none touch the water, and, as is usual, they fed flying up into the wind, turning and flying back rapidly with the wind when they had come to the end of their beat.

There evidently was a large migration of this species passing at the time, as will be seen from Mr. T. A. Coward's notes recorded elsewhere.

The number is unusually large for Cheshire. Once before a flock of twenty to twenty-five was seen—by Mr. E. A. Eason and Mr. N. Abbott. This was at Redesmere on April 18th, 1914, as recorded in *British Birds*, Vol. VII., p. 348.

A. W. BOYD.

THE LITTLE GULL ON THE YORKSHIRE COAST.

ALTHOUGH there are many records of the Little Gull (*Larus minutus*) occurring at irregular intervals on the Yorkshire coast, especially about Bridlington Bay, up to the time of the publication of Nelson's *Birds of Yorkshire* in 1907, the published records since appear to be very meagre. Until a few years ago it was seldom recorded in the Whitby district and was considered one of our most uncommon and irregular visitants. Probably some of its visits escaped notice, as close attention to the matter during more recent years has shown that it is now an annual visitor. As the visits of the birds usually extend over several weeks, those interested are afforded many opportunities for the collection of data. I give below some extracts from the large quantity of notes obtained whilst the birds were with us.

1923.—An immature bird frequented the outer harbour from July 30th until August 16th.

1924.—An adult was kept under close observation from July 30th until October 12th. When first noticed it appeared to be in almost full summer plumage. By August 2nd the

white on the forehead was beginning to show, and this had extended considerably by the middle of that month, and by the end it had apparently quite assumed winter garb.

1925.—On August 8th we observed an adult near the pier extensions which already displayed a considerable amount of white on the forehead. This gradually increased until September 14th, by which date the winter plumage seemed to be completed. This bird was seen almost daily until November 1st, after which we did not see it again.

1926.—An adult, which appeared to be in full summer plumage, was seen in the outer harbour on August 5th. No further observations of the bird were obtained.

1927.—We had a visit this year again on August 5th of an adult which showed no signs of winter plumage. By the 25th it was putting off summer dress and by September 13th we considered it had fairly got into winter dress. This bird remained with us until the close of October.

1928.—An adult bird in summer plumage was observed on August 5th and it frequented the harbour until October 30th. On August 12th the white on the forehead was in evidence and it seemed to have attained full winter plumage by the end of that month. It was frequently observed in September and a few times in October.

1929.—We looked in vain this year for the Little Gull at the time it usually turned up, but saw nothing of it until December 29th, when—after several days of very wild weather—an adult and an immature bird were seen on the wing in the outer harbour; and on the last day of the year two young birds and an adult were flying about the inner harbour. One of the immature birds was seen almost daily until January 11th, 1930.

1931.—Once again the bird failed to appear in July or August, but on September 24th an adult was seen with a small flock of Sandwich Terns (*Sterna s. sandvicensis*) on the beach about three miles north of Whitby. So far as could be seen it appeared to be about half advanced towards winter plumage.

Usually on arrival the birds were wild and unsettled and kept almost continually on the wing; later they became tamer and spent much time on the sea. They associated with the Black-headed Gulls (*L. r. ridibundus*) and at low tide reposed on the mud-banks of the inner harbour with them. They also soon acquired the habit of picking up the tit-bits which fell from the lines of anglers fishing from the

pier extensions. The call resembled that of the Common Tern. F. SNOWDON.

IVORY-GULL IN SUSSEX.

AMONG a crowd of Herring-Gulls and Black-headed Gulls at the mouth of the Rother, near Rye, on January 6th, 1931, I identified a single Ivory-Gull (*Pagophila eburnea*). The bird, an adult, was especially conspicuous among its companions by reason of its pure white mantle. Its very dark legs and greenish-black bill were also noticed. R. P. WILLIAMS.

GREAT SKUA IN MIDDLESEX.

AT Staines reservoirs on February 14th, 1931, I saw through my telescope a distant bird which resembled a Great Skua (*Stercorarius s. skua*). It was resting on the south reservoir about half a mile away, facing me, with the sun behind it. It was, therefore, impossible to do more than guess its identity. But it soon began to wash itself, and occasionally raised its wings, showing the characteristic white band at the base of its primaries. Further corroborative evidence was unexpectedly supplied by Mr. W. A. Wright and Mr. B. T. Ward, both of Chingford, who were paying their first visit to the reservoirs and were unacquainted with Skuas. They told me that, shortly before my arrival, a large brown bird, which "did not fly quite like a Gull," had flown past them; and the details which they gave me of its appearance formed a very accurate description of the Great Skua. Mr. J. P. Hardiman then came upon the scene and had a distant view of the bird, which by this time had drifted in the strong north wind almost to the south bank of the water, about 1,100 yards from us. While we were having our lunch in a sheltered spot the bird left the south water, and we found it afterwards on the north reservoir, about 600 yards away. It was mobbed for a few moments by some Black-headed Gulls and raised itself in the water, flapping its wings, showing the white patch on their under-surfaces very clearly in the sunlight.

We waited as long as we could for the bird to come nearer, but without success.

On the next day, Sunday, February 15th, I was unable to go to Staines, but am informed that the Skua was then very much in evidence, flying close to many observers and giving them an excellent view.

It was seen on this day by Messrs. L. M. Emberson, F. R. Finch, W. E. Glegg, D. Gunn, J. P. Hardiman, Dr. T. G. Longstaff and Mr. W. L. Sclater.

Mr. Gunn tells me that he visited the reservoirs again on February 16th and 18th, when the bird was still present and astonishingly tame, coming within twenty yards of him.

To-day, February 22nd, Dr. G. C. Low, Mr. F. R. Finch and I had a splendid view of it while it was devouring the remains of a Coot about 120 yards from us at the edge of the south reservoir. We had to thank Miss D. Hordern for calling our attention to the bird.

I believe this to be the first record of the occurrence of the Great Skua in Middlesex. A. HOLTE MACPHERSON.

AT Staines on February 14th, 1931, my wife drew my attention to what she described as a "large black Gull." It flew over quite alone from the north to the south reservoir. Turning the glasses on to this bird, I had a very clear view of what I identified as a Great Skua (*Stercorarius skua*). It flew into a flock of Herring-Gulls (adults and immature), arrested its flight, and then flew on alone in a southerly direction.

I saw this bird again on the following afternoon. It was quite alone and I had a very good view of it in full sunlight.

I am fairly familiar with the Great, Arctic and Pomatorhine Skuas and the size of this bird (as large as a Herring-Gull), its general brown colour with brownish-yellow nape and dark upper-parts, combined with the whitish bases of the wing-quills, conspicuous in flight and when the bird was at rest on the water, were clearly diagnostic of the Great Skua.

E. C. ROWBERRY.

CORNCRAKE CALLING ON THE WING.

ON a night in May, 1926, about 11 p.m. (summer time, but quite dark) as I was listening for Corncrakes (*Crex c. crex*), which were scarcer than usual in Northumberland in that year, I was surprised to hear the familiar sound directly above my head! I should judge the bird to have been flying at a height of about 150-200 feet above the ground. He continued to call for some seconds while flying. It would be interesting to know if any readers have had similar experiences of the Corncrake calling while actually on the wing.

D. E. GREEN.

DISTRIBUTION OF THE SOUTHERN GUILLEMOT.

IN BRITISH BIRDS, Vol. XIX., p. 274, I gave some notes on the distribution in Great Britain of the two forms of the Guillemot (*Uria a. aalge* and *U. a. albionis*) and explained that

on the east coast breeding birds from St. Abb's Head, Berwickshire, and the Isle of May, Firth of Forth, although somewhat intermediate were more like *U. a. aalge*. At that time I had not examined breeding birds from the Farne Islands, but have now been able to do so and these are clearly referable to the Southern form (*U. a. albionis*). On the west side the Southern form extends as far north as Ailsa Craig, which is only a little south of the Farne Islands. H. F. WITHERBY

NOTICE TO RINGERS.—The list of sizes of rings and the instructions on the schedule have been revised and will be sent to ringers when rings are supplied. Ringers are particularly requested to read carefully the revised instructions and list of sizes. Special attention is drawn to revised instructions Nos. 3, 5 and 10 and also to the request to write the ring numbers and letters very clearly, as careless writing has led to great trouble and makes correct filing of the cards (and therefore finding when reported) very difficult. No. 3 ring in future will be made slightly larger, as this is considered better for the larger birds included in size 3.

The list of *nestlings not* to be ringed is now as follows: House-Sparrow, Goldcrest, Tits, Sky-Lark, Willow-Warbler, Whitethroat, Spotted Flycatcher, Wren, Sand-Martin, Black-headed Gull. It has been considered advisable not to restrict the ringing of Tree-Pipits, as scarcely enough of this species have been ringed for a fair test. No Pheasant, Partridge or Grouse is to be ringed, young or old, otherwise no restriction is made in ringing adults or trapped birds, but the ringing of House-Sparrows, unless for some special enquiry, is not likely to be of value.

In the list of birds ringed in my last Annual Report (*antea*, p. 241) I regret to have omitted Mr. J. A. G. Barnes (114), and the name of Mr. B. T. Brooker should have been included as having been responsible jointly with Mr. E. F. Wood for the total of 315 given under the latter's name.—H.F.W.

RECOVERY OF MARKED BIRDS.—*Corrections*.—Swallow No. S.3887 (*antea*, p. 185) and Gannet No. 103861 (*antea*, p. 188) are both errors due to a confusion of numbers and must be deleted. Puffin No. AD.162 (*antea*, p. 217) was ringed as an adult, not young, as stated.

BLACK-NECKED GREBE IN INNER LONDON.—Dr. G. Carmichael Low stated at the December meeting of the British Ornithologists' Club that he (December 7th, 1930) and Mr.

A. H. Macpherson (December 6th) had seen all the five species of British Grebes in one day ; a Black-necked Grebe (*Podiceps nigricollis*) on the Long Water, Kensington Gardens, and the others at Staines Reservoir (*Bull. B.O.C.*, Vol. LI., 1930, pp. 43-4).

GREEN SANDPIPER IN SUSSEX IN WINTER.—Mr. E. L. King writes that on December 28th, 1930, he twice put up a Green Sandpiper (*Tringa ochropus*), probably the same bird, from the marshes by the River Adur near Old Shoreham.

HYBRID RED GROUSE AND BLACK GROUSE.—Dr. Percy R. Lowe exhibited at the December meeting of the British Ornithologists' Club a female specimen of *Lagopus scoticus* × *Tetrao tetrix*, shot near Simonstone Hall, Yorkshire, on October 14th, 1930. In his description (see *Bull. B.O.C.*, Vol. LI., pp. 42-3) Dr. Lowe points out that the bird had some characters of the Grouse and some of the Grey hen, but that these were in no sense intermediate.

LETTERS.

TRAPS FOR BIRD RINGING: THE POTTER TRAP.

To the Editors of BRITISH BIRDS.

SIRS,—This trap was described and figured by Mr. F. C. Lincoln in *BRITISH BIRDS*, Vol. XXI., pp. 139-142. It is the smallest automatic trap that has been described and thus obviously merits consideration by persons who would like to ring the common small birds frequenting their gardens but who do not wish to construct a large and elaborate fixed cage. But it is not very easily constructed by an amateur wire-worker and no information appears to have been published as to its usefulness under English conditions.

The Oxford Ornithological Society, with the assistance of a grant from the Christopher Welch Trustees, is making experiments with traps of various types and, since several requests for information as to traps have already been received from different parts of the country, it seems worth while to publish preliminary results obtained with the Potter trap and to announce where these traps can be purchased.

In a period of five weeks (January 5th to February 11th, 1931) a Potter trap in the grounds of the University Museum has made 88 captures. The following species were caught: Starling, 5; Greenfinch, 17 (+6 repeats); House-Sparrow, 4; Great Tit, 14 (+6 repeats); Blue Tit, 21 (+5 repeats); Song-Thrush, 1; Blackbird, 2; Robin, 3 (+2 repeats); Hedge-Sparrow, 2.

Another Potter trap in Christchurch Meadow in the fortnight January 30th to February 13th, 1931, made 12 captures: Starling, 6; Greenfinch, 3; Chaffinch, 1; Reed-Bunting, 1; Meadow-Pipit, 1.

In both cases the Potter trap was close to, and therefore in competition with, traps of larger size of other types, and there can be little

doubt that if the Potter traps had been operated alone they would have caught more birds.

It is clear, however, that this form of trap can be used with success for catching the smaller English birds.

For removing birds from the trap a gathering cage is almost essential. This is a small wire cage with a drop door. The cage is placed in front of the trap with its door against that of the trap. Both doors are then raised and that of the gathering cage dropped again as soon as the bird has flown into the cage. The bird can then be taken in the gathering cage to any place convenient for removal and ringing. If it is to be left for any length of time in the cage it will be found that a dark cloth placed over the cage will at once cause it to stop fluttering and remain quiet. If desired, therefore, the bird can be taken to a distance in the gathering cage for homing experiments.

Messrs. Ciceri & Co. Ltd., 39-43, Wharfdale Road, King's Cross, London, N.1, are prepared to supply Potter traps with four compartments, made of galvanized wire, of the dimensions given by Lincoln, for sixteen shillings each, and gathering cages, also of galvanized wire, for four shillings each. Traps made by this firm were used in the experiments at Oxford and have proved quite satisfactory.

DEPARTMENT OF ZOOLOGY,

W. B. ALEXANDER.

UNIVERSITY MUSEUM, OXFORD.

February 14th, 1931.

[It is as well to issue a warning here that automatic traps must be visited regularly and frequently, and when this cannot be done must be put out of action. In the breeding season such traps, if working, must be watched or visited at *very* short intervals to avoid the possibility of keeping birds away from their nests.—H.F.W.]

REED-BUNTING SHELTERING YOUNG FROM SUN.

To the Editors of BRITISH BIRDS.

SIRS,—May I be allowed a little space in which to comment on Mr. Osmaston's letter on page 197. I stick to my opinion that the attitude of the birds is chiefly to shelter the young. His comment on the fact that the bird in the upper picture is at right angles to the position of the bird in the lower picture is made without sufficient knowledge of the circumstances. There is a difference of nearly five hours in the time between which the photographs were taken. There is no shadow in the upper photograph because I waited until a small cloud covered the sun. I am very well aware of the crouch assumed by birds of prey. As Mr. Osmaston says, it is assumed *sometimes* to screen the prey from observation. It is, however, used, as I have stated, to shelter the young from sun or rain. I have also seen a Sparrow-Hawk suddenly stop feeding at the commencement of a sharp shower in hot weather and assume a similar attitude to catch the rain on its plumage and get a shower-bath; after the shower it neglected to finish the meal but proceeded to dry, clean and preen its plumage. Sparrow-Hawks will also spread their wings for another reason. When a Sparrow-Hawk surprises a bird of considerable strength it gets on the back of the bird attacked with both feet and expands and depresses its wings and tail very rigidly to help to overcome and confine the struggles of its victim. Whenever it can do so it tears at the neck and back of the victim, often making ghastly

wounds in a very short time: the Hawk often takes a considerable time to overcome and kill such birds as Wood-Pigeons or Partridges, which are heavier and stronger than itself, although it will soon render them incapable of flight. I have seen these massacres at close quarters on very many occasions. The attitude, when used for screening the prey, as Mr. Osmaston describes, is usually assumed when there is more than one Hawk present or when a bird flying by casts a shadow near the Hawk.

J. H. OWEN.

ROOKS DROPPING SHELLFISH.

To the Editors of BRITISH BIRDS.

SIRS,—In reference to your footnote on the Rook dropping "pot" egg (*antea*, p. 255), I have frequently seen Rooks carrying shellfish to a height and then dropping them, and, if unsuccessful, taking them up a little higher and then dropping them again. I cannot, however, be quite certain that I have noticed it except in one district. That is along the foreshore round Dublin Bay, where I have seen it many times. It seems to me possible that the Rooks there, if it is not the custom of the species everywhere, may have learned it from the Herring-Gulls, by which this stretch of foreshore is haunted. The shellfish attacked are usually mussels.

W. M. CROOK.

ROSEATE TERN IN WEST IRELAND.

To the Editors of BRITISH BIRDS.

SIRS,—My friend, Mr. C. J. Carroll, has drawn my attention to a mis-statement of mine (*antea*, page 226) that the Roseate Tern (*Sterna dougallii*) was not previously known from the west of Ireland. A specimen, formerly in Mr. Carroll's collection and now in the National Museum, Dublin, was shot on Clew Bay on August 3rd, 1904 (*cf. Brit. Birds*, Vol. VII., p. 186).

G. R. HUMPHREYS.

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NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U.

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ORNITHOLOGICAL REPORT FOR NORFOLK FOR 1930.

BY

B. B. RIVIERE, F.R.C.S., F.Z.S., M.B.O.U.

IN compiling this report on the birds of Norfolk for the year 1930, I have again to thank a number of observers who have kindly allowed me to make use of their notes.

As regards weather, the chief features of the year were the absence of severe frosts at either end, the violent gales which occurred in January, the spell of fine, dry weather throughout June and the first half of July, the exceptionally wet autumn, and the prevalence of fogs during December.

SPRING MIGRATION.

There is little of special interest to record with regard to the Spring Migration, but as little is known of the migratory movements of birds off the coast of Norfolk at this season of the year, and that little is extremely puzzling, it may be of interest to record the following notes made by Messrs. W. S. and S. G. Sharman, who, during the spring of 1930, were both stationed at the E. Dudgeon Light-vessel, which lies 21 miles N.N.E. of Blakeney :—

February 24th and 26th, 28th.—Sky-Larks and Starlings flying W. to E. and W.N.W. to E.S.E.

March 5th.—Rooks travelling W.N.W. to E.S.E.

March 6th, 7th, 8th and 22nd.—Sky-Larks and Starlings travelling W. to E.

March 29th, 30th and 31st.—Chaffinches travelling N.N.E. to S.S.W. Rooks N.E. to S.W. one day.

April 3rd.—Rooks, Chaffinches and Meadow-Pipits flying N.E. to S.W. Several Chaffinches and Pipits settled.

April 4th.—Two Wheatears settled and flew off to W.N.W.

April 8th.—Two flocks of Chaffinches flying N.N.E. to S.S.W. Willow-Wren settled and flew away to W.

April 10th, 11th, 12th and 13th.—Chaffinches every day travelling from N.N.E., N.E. and E. to S.S.W., S.W. and W. Several Meadow-Pipits and Starlings settled and all flew away to S.W.

May 22nd.—Several “Flycatchers” and Wheatears on board. Flew off to W.

June 3rd.—Two Turtle-Doves settled.

June 4th.—Four Turtle-Doves settled.

A spring passage of the North Sea from E. to W. is understandable in the case of certain species of birds, but a passage

from N.N.E. to S.S.W., and N.E. to S.W., as recorded under several dates in the above notes, is exceedingly difficult to explain.

That this movement regularly takes place is shown by the number of records of its occurrence—it has been observed annually for four years at the E. Dudgeon—and it is to be hoped that further knowledge may in time reveal its significance.

As regards the passage in the opposite direction, *i.e.*, from W. and W.N.W. to E. and E.S.E., it is to be noted that birds passing the E. Dudgeon travelling in this direction may be presumed to have taken their departure from the Lincolnshire coast.

AUTUMN MIGRATION.

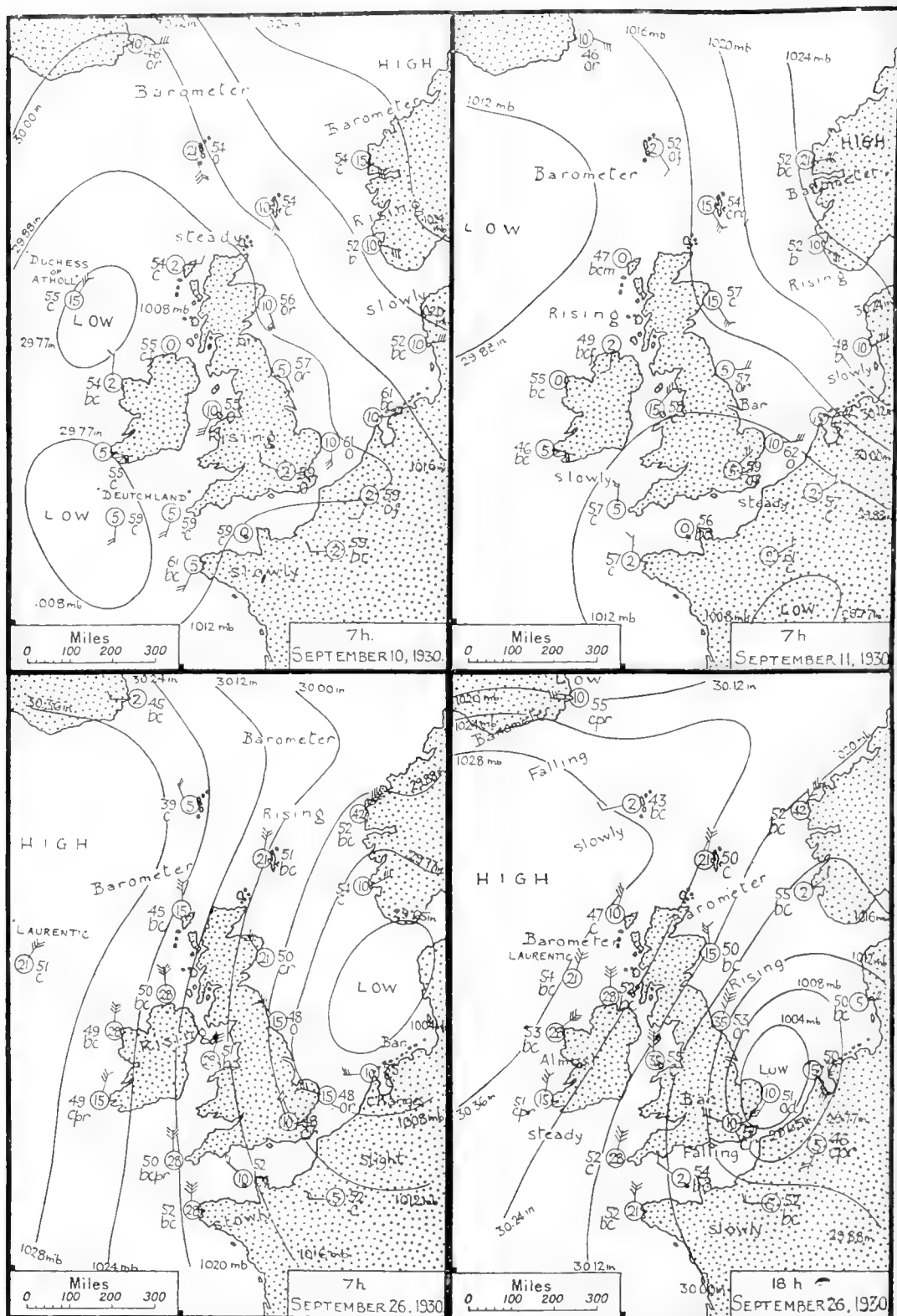
Thanks to the number of good observers who were present on our coast during the autumn some interesting notes of the autumn migration were made, and the two big "rushes" which occurred between September 10th and 13th and on September 27th and 28th were recorded in some detail. If only an equal number of observers could be persuaded to frequent the coast-line in the early spring, some of the problems of the spring migration referred to above might be brought a step further towards solution!

The "Waders," as usual, formed the vanguard of the autumn immigrants. A passage of Lapwings from E. to W. along the northern coast-line, continuing throughout the day, was noted on July 1st and 2nd by Mr. D. L. Lack, who also reported a considerable arrival of Waders, particularly Dunlin, at Salthouse and Cley on July 5th.

On August 18th a single Cuckoo was seen to fly in from the sea at Blakeney Point, and on the 20th a great E. to W. passage of Swifts was noted also at Blakeney, the birds passing on a broad front, both overland and far out to sea, during most of the day (D. L. Lack).

The earliest Passerine immigration reported was on August 25th, when Mr. Lack noted a considerable arrival of Wheat-ears and Willow-Warblers, together with a few Whitethroats, Garden-Warblers, Whinchats and Redstarts, on Cley beach.

The first big Passerine rush occurred on September 11th—with probably fresh arrivals on the 12th and 13th. The majority of these migrants appear to have crossed the North Sea on the night of September 10th, and they remained on the coast-line until the 13th, when the wind changing from N.E. to S.W., most of them moved on.



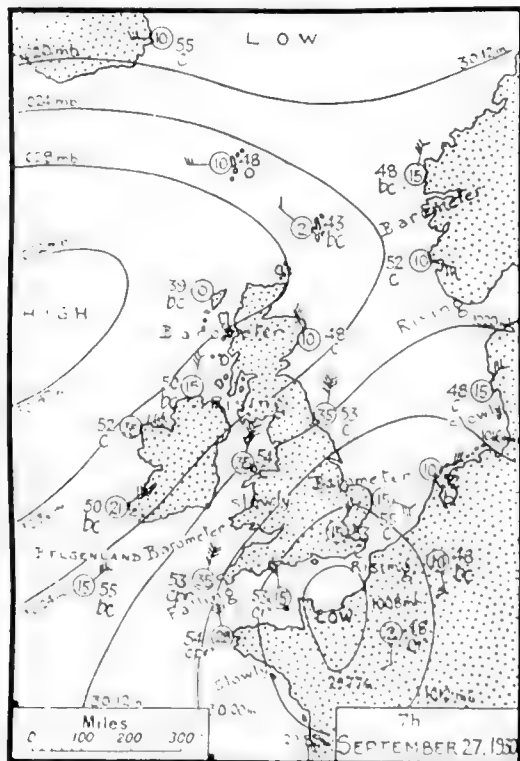
Upper :
Weather Chart, Sept. 10th.

Lower :
Weather Chart, morning of
Sept. 26th.

Upper :
Weather Chart, Sept. 11th.

Lower :
Weather Chart, evening of
Sept. 26th.

Working the *Sueda* bushes along Cley beach on September 11th, 12th and 13th, Col. W. A. Payn identified the following species: Willow-Warbler (very large numbers), Redstart (hundreds), Wheatear, Blackcap, Garden-Warbler, Common Whitethroat, Lesser Whitethroat, Bluethroat (about a dozen identified), Pied Flycatcher, Goldcrest, Ortolan Bunting (one), Reed-Bunting, Tree-Pipit, Meadow-Pipit, Hedge-Sparrow, and Wryneck (several).



Weather Chart, morning of Sept. 27th.

starts, Wheatears and other small birds being noted between September 10th and 13th, while on the 13th a Bluethroat settled on the ship and after a short rest flew off to W.S.W. (W. S. Sharman).

The weather chart on September 10th, on which this migration started, shows an anticyclone over Scandinavia and a depression situated over the centre of Britain and extending to the Netherlands. On the following day, September 11th, the high pressure area had spread south, with a rising barometer, over the North Sea and the British Isles. On the Norfolk coast the wind was from N.E. and E. on the 11th and 12th, but changed to S. and S.W. on the evening of the 13th.

The second "rush" took place during the night of September 26th, and appears to have continued, though in lessening numbers, over the 27th and 28th.

Mrs. Brindley, who was watching birds at W. Runton, noted the appearance of large numbers of Willow-Warblers, Redstarts and Wheatears on September 11th, the majority of the Wheatears having arrived, it would appear, between eight and nine in the morning. Most of these birds had moved on by September 14th.

At Scolt Head a similar arrival was observed by Dr. S. H. Long.

At the E. Dudgeon Light-ship, 21 miles off the coast, this immigration was equally in evidence, a "rush" of Willow-Warblers, Red-

At Bacton, where I was shooting on the morning of the 27th, the coastal hedges and rootfields were alive with Wheatears and Redstarts, while a number of Robins and Goldcrests, one Ring-Ouzel and a flock of Snow-Buntings were met with during the day. On the 28th I motored along the coast from Mundesley to Horsey, and during the whole journey Wheatears and Redstarts were to be seen beside the road. On Cley beach on the 27th Col. W. A. Payn identified Redstarts (great numbers), Wheatears (great numbers), Robins (great numbers), Chiffchaffs, Goldcrests, Bluethroats (in larger numbers than during the previous immigration), Garden-Warblers, Lesser Whitethroats, Blackcaps, Pied Flycatchers, Meadow-Pipits, Reed-Buntings, Snow-Buntings, Siskin (one), Brambling (one), Redwings, Song-Thrushes, Blackbirds, Short-eared Owl (one), and Woodcocks (two).

On the same day, among other migrants, Mr. H. F. Witherby watched a flock of 25 to 30 Siskins at Hickling.

At W. Runton, on the same day, Mrs. Brindley noted a great influx of Redstarts and a considerable number of Robins, two of which latter were seen to come in from the sea at mid-day and settle on the cliff edge.

Wheatears were seen by the same observer coming in from the sea from a northerly direction during the morning, until by mid-day 150 were estimated to be on one small ploughed field of about three acres.

On the morning of the 28th Mrs. Brindley again watched Wheatears coming in at W. Runton, while several were also seen to take their departure, after rising high in the air, inland to the S. and S.W. The majority of these small migrants had disappeared by the 29th. With this host of small birds arrived some exceptionally early Hooded Crows. I saw two at Mundesley on September 28th, and five or six were seen at Hickling the same day (J. Vincent). Redwings and Woodcocks were also in advance of their usual date of arrival. Both species were met with by Col. Payn on Cley beach on the 27th, and Redwings were seen by Mr. Vincent at Hickling and by myself at Mundesley on the 28th.

A study of the meteorological conditions under which this great immigration took place is, I think, of considerable interest in view of the generally accepted view that migratory movements are commenced under anticyclonic conditions at the point of departure. On September 26th, on the night of which the main body of migrants crossed the North Sea, the weather chart at 7 a.m. shows a low pressure area over the North Sea extending to the coasts of Norway, Denmark and the Netherlands, with the barometer falling over the

Netherlands and Northern France, but rising slowly over the British Isles.

At 7 p.m. the depression had moved further south and was situated between, and included, the coasts of Norfolk and the Netherlands, while the barometer was rising slowly over the North Sea. It will be seen, therefore, that although these migrants started with a rising glass, anticyclonic conditions had by no means become established at the point of departure, and the weather certainly appeared to be still unfavourable. On the Norfolk coast it was a pitch black night with no moon. A strong wind was blowing from the N.E. with occasional gusts of almost gale force, while torrents of rain fell during the night, and it is a matter for wonder how such small birds as Chiffchaffs, Goldcrests and Redstarts were able to accomplish the sea passage under such conditions.

A remarkable apparent immigration of Hedge-Sparrows was observed by Mrs. Brindley at W. Runton on September 16th, 19th and 22nd, on each of which days, in the early morning, the hedges on the cliffs were found to be full of these birds. On the 16th Mrs. Brindley counted 15 together in one place, 12 in another and 8 in a third. Upon each occasion small flocks were seen during the morning to rise in the air and fly away inland to the S. and S.W.

A great E. to W. passage of Lapwings was noted by Col. Payn at Cley on September 22nd, and almost continuously throughout the day on the 23rd and 24th (T.A.C., *Field*, December 20th, 1930, p. 879), while they were also seen passing a boat near Dogger Bank on the 23rd (*id.*, *ib.*).

A large arrival of Rock-Pipits took place on October 19th. Mr. D. L. Lack, who was on Scolt Head, tells me that the island was "alive" with them. Some 60 were flushed and identified, while several were seen to come in from the sea, some of which passed on inland to the S.W.

My latest notes of the autumn migration are from Mr. S. G. Sharman at the E. Dudgeon Light-ship, and are as follows:—

November 16th.—Starlings and Blackbirds at night. Left to W. in the morning.

November 17th.—Woodcock killed at lantern during the night.

November 18th.—Large arrival of Starlings and Blackbirds from E.N.E.

November 19th.—Five flocks, of about 100 each, of Lapwings travelling E.N.E. to W.S.W.

November 20th.—Blackbirds and Starlings in smaller numbers flying E.N.E. to W.S.W.

November 24th.—Three Redwings killed at lantern during the night.

November 27th.—Large flock of Starlings passing W.N.W.

CLASSIFIED NOTES.

NUTCRACKER (*Nucifraga caryocatactes*).—Mr. Guy Davey tells me that on October 6th he had a clear and unmistakable view of a Nutcracker at Letheringsett, but in spite of several people being on the look-out for it, it was not seen again.

STARLING (*Sturnus v. vulgaris*).—One ringed at Hemsby on February 26th, 1929, was reported from near Tilsit, east Prussia, in October, 1930.

LINNET (*Carduelis c. cannabina*).—An unusually late clutch of slightly incubated Linnet's eggs was found by Mr. G. S. B. Long at Ringwood on August 17th.

CROSSBILL (*Loxia c. curvirostra*).—On April 25th a female and two males, one of which was singing, were seen in a belt of fir trees between Harleston and Bungay (P. Hogg). This record suggests the possibility of a pair or two having nested in the locality, which is far outside the normal breeding area.

On July 17th a Crossbill was picked up dead at Rollesby, near the coast (E. C. Saunders), while Mr. A. H. Patterson reports that during the same month four were caught on a fishing boat "150 miles off Heligoland" (*Eastern Daily Press*, July 31st, 1930).

ORTOLAN BUNTING (*Emberiza hortulana*).—One was identified by Col. W. A. Payn on Cley beach during the great migratory "rush" of September 11th.

MEADOW-PIBIT (*Anthus pratensis*).—One ringed as a young bird at Cley on May 21st, 1930, was reported from Basses Pyrénées on October 6th of the same year.

BLUE TITMOUSE (*Parus cæruleus* ? subspecies).—In view of the scarcity of records of the Continental Blue Titmouse in Britain, it is perhaps worth recording that on September 10th a Blue Tit settled on the E. Dudgeon Light-ship, and after a short rest flew off in a westerly direction (W. S. Sharman).

GREAT GREY SHRIKE (*Lanius e. excubitor*).—One was seen at Waxham by Miss E. L. Turner on October 2nd.

CHIFFCHAFF (*Phylloscopus collybita*).—Mr. R. M. Garnett states that he saw a very late bird near Weybourne on November 6th (*Field*, November 29th, 1930, p. 782). One was also identified by Mr. Garnett in the same locality on November 26th, 1929.

WOOD-WARBLER (*Phylloscopus s. sibilatrix*).—Mr. N. Tracy tells me that he located two pairs breeding at S. Wootton, and two pairs at Snettisham in 1930.

FIELDFARE (*Turdus pilaris*).—A rather unusually late spring passage of Fieldfares was noted, flocks being seen at

Kelling on May 7th (R. M. Garnett) and at Hickling on May 8th (S. H. Long).

BLACKBIRD (*Turdus m. merula*).—A Blackbird ringed at Heligoland (No. 81764) on October 25th, 1930, was recovered at Rollesby on January 26th, 1931 (H. F. Witherby *in litt*).

REDSTART (*Phœnicurus ph. phœnicurus*).—Mr. N. Tracy tells me that six pairs of Redstarts, two of which reared second broods, bred in his wood at S. Wootton in 1930. I heard of no nests on the eastern side of the county.

NORWEGIAN BLUETHROAT (*Luscinia s. gatkei*).—An unusually large number of Bluethroats, presumably of this form, arrived during the two great "rushes" of small Passerine migrants which occurred between September 11th and 13th and on September 27th and 28th. About a dozen were seen by Col. W. A. Payn on Cley beach on September 11th, 12th and 13th, and still larger numbers on the 27th. On September 13th one settled on the E. Dudgeon Light-ship (W. S. Sharman).

WHITE-SPOTTED BLUETHROAT (*Luscinia s. cyanecula*).—As already reported (*Brit. Birds*, Vol. XXIII., p. 339) a male White-Spotted Bluethroat was seen and identified by Mr. R. M. Garnett at Salthouse on April 7th and 8th. This species has never previously been recorded in the county, but as the bird was under observation for a prolonged period at close quarters there can be little doubt as to the correctness of Mr. Garnett's identification, and he is to be congratulated on this interesting record.

SWALLOW and MARTIN (*Hirundo r. rustica* and *Delichon u. urbica*).—A competition was organized this year by the *Eastern Daily Press*, with an offer of two prizes, one for the greatest number of occupied House-Martins' nests upon any single building in the county, and one for the largest number of occupied Swallows' nests on any farmstead or homestead. Dr. S. H. Long, who was deputed to make the awards, received the returns in the last week of June. These were 135 in number, and gave a total of 3,019 nests, of which, after inspecting a considerable number, Dr. Long estimated that no more than 200 were Swallows'. The largest number of House-Martins' nests were found under the eaves of Newfound Farm, Cringleford, and numbered 105, while the highest total of those of the Swallow was 34, these being situated in some old farm buildings at South Raynham (S. H. Long).

Two late House-Martins were seen at Bacton by Mr. R. C. Bell on November 10th, and one at Hemsby on November 23rd by Miss J. Ferrier.

ALPINE SWIFT (*Apus m. melba*).—As already reported, one was seen near Hunstanton on September 25th (P. H. Ball, *Field*, November 8th, 1930).

KINGFISHER (*Alcedo a. ispida*).—One was caught at the Lynn Well Light-ship, at the mouth of the Wash, on April 4th (W. S. Sharman).

NORTHERN GREAT SPOTTED WOODPECKER (*Dryobates m. major*).—A considerable immigration of Great Spotted Woodpeckers seems to have occurred during the late autumn of 1929, and they were unusually abundant in the neighbourhood of Yarmouth during the winter (A. H. Patterson). A female sent to me by Mr. E. C. Saunders, which was killed at Horsey on January 6th, 1930, proved to be a typical example of the northern form.

SHORT-EARED OWL (*Asio f. flammeus*).—Two pairs nested in the Broads district and both reared broods (J. Vincent).

MARSH-HARRIER (*Circus æ. æruginosus*).—One pair nested in the usual locality. The male arrived on April 5th and the female on April 10th. The first egg was laid on May 10th and on the 24th there were six eggs. From these, five young ones hatched, of which one died and four reached maturity. The incubation-period in this case appears to have been thirty-three days (*cf.* J. Vincent, *antea*, p. 80).

MONTAGU'S HARRIER (*Circus pygargus*).—Some five or six pairs were present in their favourite haunt during the summer, the first birds arriving on April 23rd. As already reported, one of the nests contained eventually a clutch of ten eggs, all of which Mr. J. Vincent is convinced were laid by the same bird. This nest was unfortunately robbed (*cf.* J. Vincent, *antea*, p. 81).

A young one, ringed at Hickling on June 24th, 1930, was reported from Lagarde (Cantal), France, on September 21st.

HEN-HARRIER (*Circus c. cyaneus*).—A male was seen on March 5th, and two females or possibly immature males on November 9th, at Cley (R. M. Garnett, *Field*, November 29th, 1930, p. 782).

HONEY-BUZZARD (*Pernis a. apivorus*).—An immature bird was trapped at Rollesby on September 16th (E. C. Saunders).

OSPREY (*Pandion h. haliæetus*).—On May 24th an Osprey was shot near Stradsett (Sir W. Bagge), while during the autumn, as already reported in *British Birds* and *The Field*, an unusually large immigration of these birds took place.

On September 13th one, now in the Norwich Museum, was shot near Harleston. On September 17th one was caught on board a fishing boat and brought into Yarmouth. During the latter half of September and first week of October one

frequented Hickling Broad (J. Vincent). On September 20th one was seen over Rockland Broad (E. A. R. Ennison). From October 12th to 22nd one was watched almost daily by Miss M. Barclay at Gunton Lake, while the last one reported to me was seen near Holt by Mr. M. Meiklejohn on October 27th.

WHITE STORK (*Ciconia c. ciconia*).—A bird, identified as a White Stork, was seen to arrive from the sea at Eccles by Mr. Le G. Clark on May 10th (J. Vincent).

SPOONBILL (*Platalea l. leucorodia*).—At Cley and Salthouse Marshes the first Spoonbill reported to me was one seen by Mr. E. Bird on April 8th. Single birds were also seen on these marshes on April 10th, May 12th, May 22nd and June 20th (R. M. Garnett, *Field*, November 29th, 1930, p. 782).

BITTERN (*Botaurus s. stellaris*).—Mr. Vincent reports an improvement in the number of Bitterns nesting in the Hickling and Horsey area after the decrease noted last year as a result of the severe February frost.

[FLAMINGO (*Phoenicopterus r. antiquorum*).—On August 6th and again on August 10th, a Flamingo was seen on Breydon. From about this date until November 19th or 20th one was frequently seen on the Wells marshes (G.T.C., *Eastern Daily Press*, November 26th, 1930). On November 23rd one was seen on the coast between Winterton and Hemsby in the morning, and on Bacton beach in the afternoon, and on November 25th one, probably the same bird, was found injured on Overstrand beach and destroyed (*t.c.*, November 25th and 26th, 1930). A Flamingo which had been found in an exhausted condition near Yarmouth three years before, and had since been kept unpinioned in his garden by Mr. Powell of Lowestoft, escaped early in August of this year (J.K., *t.c.*, August 11th, 1930) and it is possible that this was the bird seen on Breydon. The specimen killed at Overstrand appears, however, not to have been Mr. Powell's bird as might have been assumed, for Mr. F. C. Ratcliff, who examined it after death, tells me that this bird had both wings clipped, whereas Mr. Powell's was full-winged. From whence the Overstrand bird escaped has not been ascertained.]

WHOOPEE SWAN (*Cygnus cygnus*).—Whoopers appear to have put in an appearance unusually early this year, and Capt. H. J. Cator tells me that he saw a herd of twelve at Ranworth on October 28th.

MALLARD (*Anas p. platyrhynchos*).—Attention must be drawn here to a number of interesting records of Mallards ringed at Hickling in March, 1930, and reported from Denmark, Sweden and Germany in the late summer and autumn of the same year (*cf. antea*, p. 187). A further recovery, Mr.

Witherby informs me, has been reported from Kurland, Latvia, where one of these birds was found on July 20th, 1930.

GARGANEY (*Anas querquedula*).—Garganeys were again numerous in 1930, and this beautiful little duck bids fair to become as abundant again in Norfolk as it appears to have been during the last century. For many years, prior to 1928, it was exceedingly scarce, only two or three pairs breeding each year in one small area of Broadland. In 1928, possibly owing to the formation by Capt. H. J. Cator of an extensive area of flooded marshes at Ranworth, a large increase in the number of breeding pairs took place, and this increase has been maintained each year since. Hickling and Ranworth are its principal strongholds, but a pair or two have for the past three years nested annually at Cley.

I learn from Capt. Cator that a female was shot when flighting at Ranworth on December 12th. The only other winter record I know of is one which was killed at Martham on December 9th, 1915 (Gurney, *Zoologist*, 1916, p. 265).

LONG-TAILED DUCK (*Clangula hyemalis*).—It is perhaps worth recording that on January 27th—during very mild weather—two adult drakes were shot at Burnham (F. E. Gunn).

RED-NECKED, SLAVONIAN, AND BLACK-NECKED GREBES.—On May 16th a Red-necked Grebe (*P. griseigena*), which appeared to be in full summer plumage, was seen close inshore off Blakeney (M. Barclay). On September 28th a Slavonian Grebe (*P. auritus*) was seen in Heigham Sound (J. Vincent). On May 2nd a Black-necked Grebe (*P. nigricollis*) was seen at Hickling (J. Vincent) and on November 23rd one on some flood water near Dereham (M. Barclay).

NORTHERN GOLDEN PLOVER (*Charadrius a. altifrons*).—As reported, *antea*, p. 72, a Northern Golden Plover which had been ringed for Mr. P. Skovgaard in Iceland on July 4th, 1928, was recovered near King's Lynn on February 3rd, 1930.

RUFF (*Philomachus pugnax*).—A single Ruff was seen by Mr. D. L. Lack on Cley Marsh on July 5th, an unusually early date.

LITTLE STINT (*Calidris minuta*).—Spring records of this species are sufficiently scarce to warrant recording one seen by Mr. C. W. Benson at Scolt Head on June 8th. During the autumn a fair number were present on the coast, and at Kelling on September 21st I watched a small party of five feeding within a few yards of me.

SPOTTED REDSHANK (*Tringa erythropus*).—One was seen on August 19th, and two on August 20th at Cley (R. M. Garnett).

On August 20th five were seen at Hickling (J. Vincent), and on August 27th and September 29th several at Wolferton (C. T. M. Plowright).

RED-NECKED PHALAROPE (*Phalaropus lobatus*).—One was seen on Salthouse Broad on September 2nd (R. M. Garnett). Another—in juvenile plumage—frequented a small pond at Kelling from September 18th to 24th (R.M.G.). This bird, as is usual with this species, was absurdly tame, and on September 21st I was able to watch it busily feeding within a distance of a few yards.

AVOCET (*Recurvirostra avosetta*).—One was seen on the Bure Marshes on May 7th (A. H. Patterson). On December 9th an adult male was sent in to Yarmouth from a locality on the coast (E. C. Saunders). This bird was very emaciated and showed no signs of having been shot, and I understand that it was picked up dead. I know of only one other record for December, namely, one shot on Breydon on December 5th, 1926.

BAR-TAILED GODWIT (*Limosa l. lapponica*).—An adult male Bar-tailed Godwit, now in the Norwich Museum, which was shot on the coast in the third week of January, proved to be in rather an unusual and interesting condition of plumage, a large amount of the red plumage of summer having been retained on the neck, breast and under-parts. These red feathers were very much worn, and the bird had evidently failed to complete its autumn moult.

BLACK-TAILED GODWIT (*Limosa l. limosa*).—Single birds were seen at Salthouse on July 16th (R. M. Garnett), August 18th (D. L. Lack), and August 23rd (R.M.G. and D.L.L.).

SANDWICH TERN (*Sterna s. sandvicensis*).—After an almost complete absence of three years the Sandwich Terns returned in force to Scolt Head this season, much to the satisfaction of Charles Chestney, our Scolt Head watcher. Dr. S. H. Long estimated the number of pairs breeding there at some 500, while not a single nest was found at Blakeney Point.

A considerable colony again nested on Salthouse Marsh, 313 young ones being ringed there on June 20th and 21st (R. M. Garnett).

Birds ringed at Salthouse, Scolt Head and Blakeney have been reported during the year from Norddorferstrand, Germany, Calvados and St. Valery-sur-Somme, France, south Portugal, Ivory Coast, west Africa and Port Elizabeth, South Africa (*cf. antea*, pp. 215-16).

ROSEATE TERN (*Sterna d. dougallii*).—Two pairs nested at Scolt Head this year, and both hatched off successfully

(C. Chestney). It is a curious fact that in Norfolk this species appears to follow the Sandwich Terns, and always to select for breeding purposes a colony in which the latter are nesting.

LITTLE GULL (*Larus minutus*).—From January 18th an immature bird frequented a small sheet of water at Weybourne for a week (R. M. Garnett, *Field*, November 29th, 1930, p. 782). It was unfortunately shot on the 25th, and is now in the Norwich Museum. Between May 19th and 27th another young bird was seen at Hickling (J. Vincent). On September 21st I watched an adult at Salthouse, and a few days later this bird was picked up dead.

COMMON GULL (*Larus canus*).—One ringed (Goteborg, 9667D.) at Hallands Väderö (Scania), south Sweden, as a young bird on June 30th, 1930, was reported from Holme on December 19th (J. F. Thomas).

SCANDINAVIAN LESSER BLACK-BACKED GULL (*Larus f. fuscus*).—Mr. D. L. Lack informs me that on August 18th he identified a specimen of this dark-backed race at Blakeney. Its mantle appeared to Mr. Lack to be even blacker than those of some Greater Black-backed Gulls with which it was in company, and this, together with its yellow legs, left no doubt as to its identity.

GLAUCOUS GULL (*Larus hyperboreus*).—On May 24th an immature Glaucous Gull was identified by two good observers, Messrs. C. Bird and E. Ramm, at Salthouse. On June 3rd one, probably the same bird, was seen in the same place by Col. E. Todd, who was able to compare its size with that of some Greater Black-backs with which it was in company. This is the first well-authenticated summer record of this species in Norfolk that I am aware of.

ICELAND GULL (*Larus leucopterus*).—One was identified by Mr. J. Vincent at Horsey on November 26th.

GREAT SKUA (*Stercorarius s. skua*).—One was seen on September 3rd and two on November 4th by Miss J. Ferrier at Scolt Head.

LITTLE AUK (*Alle alle*).—A few put in an appearance in November. Two were seen flying west at Cley on November 5th and one on November 13th (R. M. Garnett). On November 7th one was caught by a cat at Harleston some twenty miles inland (F. W. Maidment).

[CRANE (? species). On May 14th a Crane was seen by Major A. R. Buxton flying N. over Fritton Lake. On May 26th one was seen by Sir Hugh Beavor flying E. over Langmere, and about the middle of June one was seen by Mr. C. Gurney flying E. over Northrepps. To what species this bird or birds belonged could not be ascertained.]

FIELD-REFLECTIONS ON THE NESTING, SONGS AND CRIES OF THE BRITISH MARSH- AND WILLOW-TITMICE.

BY

JOHN WALPOLE-BOND.

MARSH-TITMOUSE (*Parus palustris dresseri*).

· NESTING.—Generally using as a site, tree, stump or stub, with oak, birch, alder, elder, apple and pear ruling first in its affections, this species nests indiscriminately in natural hollows (usually knot-holes with very small entrances), and —*despite didactic edicts to the contrary*—chambers of its own chiselling, though in the latter case, of course, the wood has to be more or less rotten. A self-hewn cavity, though often fairly roomy, always has an aperture of insignificant size—one, indeed, only just big enough to admit of the birds' comfortable ingress and egress. This aperture, moreover, is hardly ever even tolerably circular and never smooth-edged, but, on the contrary, nearly always of a somewhat (upright) oval shape with a rim that is rather rugous and ragged. During excavation practically every chip is removed to some distance by the scrupulously careful carpenters. Rather a peculiar site is that furnished by a stump (generally one of birch or alder) which has weathered to such an extent that sometimes even of the whole concern there only remains a thin rind of bark often as friable as half-charred paper. The nest, naturally, is wedged into the bottom of the "funnel" (*i.e.*, where the core begins), and is thus, so to speak, open to the sky. But perhaps the greatest curiosity of the matter is that—*frequently* in my own experience—the owners, not content with the opening from aloft, make a small boring through one side of the adit about six inches above the nest, always, too, having recourse to this orifice when visiting or leaving home. Taken all round, nest-boxes are only called upon occasionally; and as a very rare site may be mentioned a small hole in even level ground—that of a mouse, for example. I have yet to see or hear of a nest in natural rock or masonry.

Most nests are close or fairly close to the ground, *i.e.*, from an inch or so to a few feet therefrom. But occasionally one is slightly subterranean, as when in a mouse-hole, whilst another may be at even a considerable distance from the soil—I have indeed very exceptionally known an altitude of all 50 feet attained.

There are two distinct types of nest. No. 1 shows a wad of fur (rabbit's especially), wool, down and hair (some or all) backed up by a separate groundwork of moss, though I have

seen examples lacking this material entirely ; whereas No. 2 is made of vegetable-fibre, dried grass, strips of bark and a few small feathers—I do *not* mean those shed accidentally from the Tits themselves—together with a few scraps of down, wool or fur and sometimes a fragment of moss, the whole often being well mixed up and somewhat dessicated. It is hardly necessary to add that intergrades occur, but No. 1 is *easily* the standard type, and No. 2 *easily* the rarest and generally the smallest, sometimes, indeed, being nothing more than a skimpy pad of matting.

I have substantial reasons for supposing that the cock, sometimes at any rate, helps to hatch the eggs which, though from five to eleven in number, are nearly always from six to eight. There is no proof positive that two broods are reared in the course of the year more than most occasionally.

Like the rest of its genus, the Marsh-Tit is a remarkably close sitter, nearly always, in fact, waiting to be removed from its charge, an indignity it often resents by biting fiercely. On being liberated it makes all haste for one of the nearest trees, from which coign of vantage it berates the interloper roundly. More than once I have seen a Marsh-Tit, when put off eggs, fly up to its mate, which was close by, and flutter its wings vigorously yet tremulously, though for what motive I have not yet divined. This action is usually associated with rations and coition.

Most Marsh-Tits have fresh clutches during the first half of May, but a sprinkling are just a trifle later, whilst, in mild seasons especially, sets at the extreme end of April are not really prodigious. My earliest date for a full laying in Sussex is April 23rd.

SONGS AND NOTES.—To the tyro, most Tits' cries are apt to be perplexing ; even the " old hand " has sometimes to confess to momentary check or even fleeting error. But the Marsh's are certainly characteristic and not hard to grasp. First and foremost there is that loud, harsh, nasal *tchee-tchee* (sometimes *tchee*³), variously *tchee-tcheu* or even *let-be*, very frequently indeed followed on the instant by a scolding *chick-a-bee-bee-bee-bee-bee*. Then we get a cry which may be syllabled as *seep* ; and another sounds like the word *chip*. Hissing and (or) blowing noises are emitted by an incubating bird when interfered with. Two phases of song occur. The most frequent one is evidently an elaboration of two of the call-notes, since it starts with from three to five *see-ips* and finishes with a quicker repetition of some half-dozen *chips*. It is throughout a hard, if rather full and slightly metallic, neume, which somewhat calls to mind the semi-trilling part of the Lesser Whitethroat's strain, or the tinkling monotone of the Girl

Bunting. The other phase is an iteration of five notes, each one being slightly higher than the last. In a general way singing is conducted from rather a high point in at any rate a tallish tree. This, however, does not signify that lower stances are *badly* neglected. On the contrary, the bird performs with tolerable frequency even from low down in under-wood. Song is at its zenith and of regular occurrence from early January to about the beginning of May, though some individuals, I think, call a cessation early in April. From early May to the end of July the bird sings but very rarely, and in August and September seemingly not at all. During the last quarter of the year, however, voice is regained, but not to any marked extent, since October hears remarkably little, and November and December not a great deal, of it.

One last word. Mr. D. H. Meares in his able and interesting remarks on the "Marsh-Willow" question at the November, 1930, meeting of the British Oological Association (*Bull. B.O.A.*, No. 28) made one little mistake. For the owners of the nest shown as doubtful were "*Marshes*"—I *definitely* identified them by their cries, and I cannot imagine how he came to forget this. Indeed, I am still under the impression that he *too* heard the cries and at once exclaimed *palustris*.

WILLOW-TITMOUSE (*Parus atricapillus kleinschmidti*).

In general habits Marsh- and Willow-Tit are very alike. In fact, the only differences worth mentioning—and they are slight enough—are that the "Willow":—

1. Is more addicted to soggy and swampy surroundings.
2. Nearly always (if about 85 per cent. to 90 per cent. may equal this expression) *makes* its nest-hole, the opening of which, moreover, is frequently more or less rounded.
3. Very seldom removes the chips hacked out of the above in course of construction, but, on the contrary, very generally drops them to the ground beneath the nesting-site.
4. Never, apparently, uses a nest-box, though I think that with a little trouble it might be induced to do so; nor a hole in soil.
5. Always, it seems, breeds at a low elevation, a nest as much as six feet from the ground being a rarity. Most examples are from a few inches to about a yard from the earth.
6. On the whole makes a much slighter nest, which, in construction, is generally type No. 2 described under Marsh-Tit—the *rarest* type, you will recall, with the latter bird—the one which shows but *scraps* of down, wool or fur, and sometimes a little moss, intermingled with vegetable-fibre,

dried grass, bark-strips and a few small feathers. Incidentally, I have seen nearly half a dozen "Willows'" nests composed *exclusively* of vegetable-down, and very little of that—a type I have never seen with the Marsh-Tit.

7. As a rule lays rather a "longer" clutch, *i.e.*, one seldom consisting of less than eight or nine eggs, whilst slightly larger numbers are not really uncommon; but I can see no difference in the eggs (of the two birds) themselves.

8. Is seldom so demonstrative at the nest; that is, it generally scolds less.

On the other hand *nearly all* the "Willow's" utterances are utterly unlike those of its cousin, some of them, in fact, *startlingly* so. Let us to its song first. This, then, although sometimes commencing with a series of hard, tuneless *chips* not strikingly diverse from this note as rendered by *palustris*, is much more often from start to finish a *deep, rich, melodious* repetition of a word which may be syllabled as *tchu*. This may better be expressed if I say that, to me at any rate, it resembles a cross between the *jug* of the Nightingale and the *twee* of the Wood-Wren (or perhaps even this bird's "alarm" of *de-ur*), with, perchance, a soupçon of the Nuthatch's whistle thrown in. On the whole, though, it is most reminiscent of the Nightingale; so strong, indeed, is the similarity sometimes that on more than one occasion I have been out with a man not really versed in bird-language who, until his mind had been disabused by a sight of the musician, has vehemently insisted that it *was* a Nightingale. The song-period is the same as that of the Marsh-Tit, but of the two birds the Willow, I think, sings the less.

Now for the cries. The one most frequently heard—it is, for instance, used commonly at the nest—can only appropriately be described as a "hot," twanging *tchay* or *chay* (of much deeper pitch than the *tchee* and its variations of *palustris*), usually given thrice, though now and again a few times more. What is possibly—I will not say probably—a corruption of the above is a note which sounds like *zar*, similarly dealt with. Sometimes these calls are prefixed by a thin single utterance of *tsit* or *sit*. In addition there is a curious strident cry and an iterated *to-wit*; whilst a sitting bird, when the hole containing it is under examination, blows and (or) hisses.

The above notes are a *précis* of many years' observation, and I have come to the conclusion that he who desires *real* intimacy with the Willow-Tit should cultivate its song and calls sedulously. For, short of boundless butchery, these, and these alone, will teach him the bird's *true* status and distribution.

BIRDS OF INNER LONDON.

BY

A. HOLTE MACPHERSON.

(NOTE.—The above designation, "Inner London", applies to an oblong area: the centres of the upper and lower boundaries being $2\frac{1}{2}$ miles due north and south of Charing Cross, and those of the two sides 4 miles due east and west of that point.)

ADDITIONAL SPECIES.

THE following species may be added to the list published in this Magazine in 1929 (Vol. XXII., pp. 222-244) and the additions in 1930 (Vol. XXIII., p. 266).

SOUTHERN GUILLEMOT (*Uria a. albionis*).—Two birds of this species were seen on the Thames just above London Bridge on November 7th, 1930 (P. H. Trahair Hartley, *B.B.*, Vol. XXIV., p. 197).

ADDITIONAL NOTES IN 1930.

Several JAYS (*Garrulus g. rufitergum*) again frequented the grounds of Holland House, Kensington, throughout the summer, though I am still without any evidence that they nested.

From the beginning of October an unusual number of COAL-TITS (*Parus a. britannicus*) were noticed in the parks.

Major A. H. Daukes informs me that on August 31st a young PIED FLYCATCHER (*Muscicapa h. hypoleuca*) visited his garden in Egerton Terrace, Chelsea.

In addition to a few WHEATEARS (*Enanthe æ. ænanthe*) which passed through London as usual in April, a flock of from 25 to 30 was seen by Miss M. Rew in Regent's Park on May 6th and 7th.

A REDSTART (*Phœnicurus ph. phœnicurus*) visited the grounds of the Natural History Museum, South Kensington, on April 9th (F. W. Frohawk, *Field*, April 26th, 1930), and Major A. H. Daukes noticed one on October 5th in his garden in Chelsea.

For about three months a GREEN WOODPECKER (*Picus v. virescens*), a bird which has not been recorded from Inner London since 1904, frequented the grounds of Holland House. It was first noticed in the middle of January. Its laugh could often be heard, and I saw it on various occasions up to April 13th. It appeared to be a solitary bird. I am informed by Miss M. Rew that on March 6th she saw a Green Woodpecker, perhaps the same one, in Regent's Park.

A SPARROW-HAWK (*Accipiter n. nisus*) frequented the vicinity of the Zoological Gardens during the autumn (D. Seth-Smith, *Report to H.M. Office of Works Bird Sanctuary Committee*).

Miss M. Rew tells me that during a fog on November 27th she and her brother came upon a LITTLE OWL (*Athene n. vidalii*) on the branch of a small tree in Regent's Park. A bird of this species was also seen by one of the bird-keepers in the Zoological Gardens on December 3rd; it was perched on the railings of the Outer Circle road (D. Seth-Smith, *t.c.*).

A pair of MALLARDS (*Anas p. platyrhynchos*) aroused considerable interest by selecting the garden of New Square, Lincoln's Inn, as a nesting-place. In the middle of the garden there is a small ornamental pond, by which a square hamper was placed on its side. After laying two eggs on the grass, the duck made a nest in the hamper and laid five eggs. In June, three ducklings were hatched and reared.

A drake COMMON SCOTER (*Oidemia n. nigra*) was on the lake in Regent's Park on April 6th, where it was seen by Mr. D. L. Lack and his father, Dr. H. L. Lack. His brother, Mr. C. C. Lack, found it there on the following day.

Mr. P. H. Trahair Hartley tells me that on March 6th he saw a CORMORANT (*Phalacrocorax c. carbo*) in the Pool of London.

In rather foggy weather during the first week of December a BLACK-NECKED GREBE (*Podiceps n. nigricollis*) visited the Long Water, Kensington Gardens. I discovered it on December 3rd and it remained for several days, never moving far from the bridge across the Serpentine. It was seen by several ornithologists. So far as I am aware, only one example of this species has previously been recorded from Inner London.

Miss M. Rew, to whom I am indebted for several interesting notes from Regent's Park, where birds have until lately received but little attention, informs me that she saw five LAPWINGS (*Vanellus vanellus*) there on December 23rd, and a COMMON SANDPIPER (*Tringa hypoleucos*) on one of the islands in the lake on April 27th. She also heard a flock of CURLEW (*Numenius a. arquata*) passing over the Park at 1.15 a.m. on the morning of July 31st.

A COMMON SNIPE (*Capella g. gallinago*) passed over Marlborough Place, N.W., at 10 p.m. on August 30th. It was flying south and calling (D. L. Lack).

A COMMON TERN (*Sterna h. hirundo*) was noticed by Mr. D. Gunn flying over the Long Water, Kensington Gardens,

on the afternoon of Monday, April 7th. The next morning I found it over the Round Pond. Here it was seen daily for the rest of the week. On July 23rd two Common Terns were seen over the Serpentine by Mr. Anthony W. Dell.

In Kensington Gardens on November 21st I watched several BLACK-HEADED GULLS (*Larus r. ridibundus*) hovering over some elms and pecking at the topmost twigs, in the manner described last year by Mr. R. Patterson in a note headed "Black-headed Gulls eating leaves" (*B.B.*, Vol. XXIII., p. 226). I have more than once seen this performance and supposed the birds were seeking insect food. On this occasion, at any rate, they were not eating leaves, for the trees were bare.

In my original list of Inner London birds the Common Tern was regarded as of doubtful occurrence and was placed in brackets, which can now be removed. That list, excluding doubtful occurrences, contain 126 species; with those since added it now numbers 131.

MIGRATION ROUTES OF WOOD-PIGEONS IN WORCESTERSHIRE.

BY

T. J. BEESTON.

FOR a number of years I have been interested in the migratory movements of birds in the valley of the Stour in north-west Worcestershire and have records which tend to show that the Wood-Pigeon (*Columba p. palumbus*) makes very definite autumnal migrations in a south-westerly direction through this valley. Circumstances have not left me free to give the necessary attention every autumn and my records are not as complete over the period under review as I now see they might have been, but are, I think, sufficient to warrant the keeping of closer watch in future years with a view to working out particulars of the movement.

My first note is for the year 1912, when on October 31st I write "many flocks Wood-Pigeons passed on east side of village (Cookley) going to south-west. Their flight was direct, in compact order and at a great height. Thousands must have passed between daybreak and 9 a.m., as they were in large companies, about 100 in some, and these were passing every two or three minutes."

In 1913 the following records were made:—

Oct. 27th.—"Flocks of Wood-Pigeons passing morning."

Nov. 5th.—"This morning from daybreak flocks of Wood-Pigeons began to move across the east side of village, averaging about fifty in a flock. This was kept up at intervals of a few minutes until 9 a.m. Afterwards the flocks became fewer and smaller. The line of flight was exactly as in the case of those I saw on October 31st last year."

In 1914 I have a note mentioning a passage of Wood-Pigeons at 7.30 a.m. on November 3rd.

I am unable to trace any record for 1915, but several entries were made in 1916 as follows:—

Oct. 28th.—"Large flocks Wood-Pigeons passing south-west on east side."

Oct. 30th.—"More Wood-Pigeons."

Oct. 31st.—"Several flocks Wood-Pigeons early morning, usual route."

Nov. 4th.—"More Wood-Pigeons."

Nov. 9th.—"Great migratory movement of birds, especially of Wood-Pigeons. The Pigeons came along soon after

daylight in large flocks of 200-300 and were passing to south-west for two hours. At one time I saw a great stream which I estimated to be more than a mile long and of very considerable width. They mostly passed east side of my house as usual."

Nov. 12th.—"Wood-Pigeons continue to south-west each morning."

From this time until 1924 written notes are not available. In 1924 my notes show the passing of Wood-Pigeons much later than I had usually seen them. At any rate I have nothing until November 19th, when I write: "Large flocks Wood-Pigeons going south-west."

Nov. 20th.—"Wood-Pigeons going west. I have not previously seen any westerly flight."

Nov. 21st.—"Wood-Pigeons going west in good numbers. Also flocks going usual south-west route."

Nov. 27th.—"Several large flocks Wood-Pigeons going south-west meeting a south wind, flying lower than when calm and tacking 8 a.m. Heavy rain previous twenty-four hours."

Dec. 1st.—"Large flocks Wood-Pigeons going south-west. Morning."

Dec. 11th.—Wood-Pigeons on south-west track."

In 1925 I have one brief note:—

Nov. 6th.—"Wood-Pigeons flying south-west at 8 a.m."

On November 5th, 1927, I have a long note, summing up apparently what I then thought of the movement, as follows: "This morning, being calm and of that quiet softness peculiar to a few days just at this season, there were thousands of Wood-Pigeons passing here to south-west as I have seen them passing every autumn in varying numbers for many years. They began at daylight and continued until about 8.30 a.m. It is a most distinct migration and one which could be easily observed over the country."

It is interesting to see a local Wood-Pigeon "flying the opposite way to the migratory flocks; the local bird flies rapidly and feverishly while the migrants have steadied down to a moderate speed, notwithstanding there is a sort of 'carry on' appearance in their flight."

On November 11th and 12th, 1930, there were many flocks passing at the usual time and in the usual direction. Also on the 11th one flock flying east to west, as was noted on a previous occasion. No return movement has been detected at any time.

I have consulted some of the principal works on migration as well as some general and county works, none of which has much to say regarding the migratory movements of this species. Gätke saw but little of it. Eagle Clarke and A. L. Thomson have only passing references. In the valuable reports of the Migration Committee of the British Ornithologists' Club there are a few references which indicate large movements in various parts of the country, the more significant of which are those of a Warwickshire observer who records for October 31st and a few dates in early November, 1911, many flocks passing Hampton-in-Arden (Avon Valley), the direction mentioned being S.S.W. and time 8 a.m. The Avon Valley lies parallel with this and Hampton-in-Arden some twenty odd miles east of my place of observation.

The recoveries of marked Wood-Pigeons so far recorded by *British Birds* indicate that those bred in this country are more or less sedentary.

Enough has now perhaps been said to show :—

- I. That this autumnal movement, whether local or otherwise, is one which comes definitely into view.
- II. That observations tend to show that this species uses river valleys as flight lines and that it may have flight lines in several directions in this country.
- III. That the movement is often one of large numbers and great extent and takes place under circumstances which render it easy to follow.

[It is well known of course that vast numbers of Wood-Pigeons come into England in autumn and their arrival on the east coast between Northumberland and Norfolk is a well-established fact, though not many detailed observations have actually been published. It has generally been assumed that these swarms soon break up and scatter in smaller flocks to districts where suitable food supplies are abundant. The large numbers and the regularity of the movement recorded by Mr. Beeston suggest that this is not invariably true and that in some parts of the country the roughly east to west migration is continued along well-defined routes. Other observers have probably made notes in past years on the subject and it appears to be one that is worth following up. —Eds.]

ON SOME RESULTS OF RINGING GREENFINCHES.

BY

A. W. BOYD.

A VERY considerable number of Greenfinches (*Chloris c. chloris*) has been ringed under the *British Birds* Ringing Scheme and there have already been recoveries enough to make it worth while to analyse these records and see if any definite conclusions can be drawn from them.

Between 1909 and 1930, 8,814 Greenfinches were marked: 190 of those ringed between 1909 and 1929 were recovered—an average of 2.2 per cent., and of those ringed in 1930 also a number has already been reported.*

It will be best to tabulate the recoveries first of all, and for that purpose the most convenient system is probably that used by Dr. A. L. Thompson when he worked out the recoveries of marked Starlings (*British Birds*, Vol. XVI., pp. 62-76).

Though the birds have been marked in a number of localities in Great Britain—from Perth to Devon—the recoveries may safely be tabulated together, as the results from one locality or another do not seem to differ in principle.

The recoveries may be divided into the following groups:—

- (i) Those marked as nestlings or young birds between April and August.
- (ii) Those marked as adults in summer between April and August.
- (iii) Those marked as adults in winter between November and March.

Birds which have been recaptured several times are recorded in these tables once only for each season in which the recovery took place. When recaptured *only* within very few days of ringing (as they most frequently are) they are not included in this tabulation.

* The recoveries made under the Aberdeen University Scheme were as follows:—

First Interim Report (1909-12), *Scottish Naturalist*, 1912, pp. 241-247. 39 recoveries, 22 within a short time of marking. Of the remaining 17, 9 were marked as adults in winter and recaptured in or near the same place, 5 in the next winter and 4 in April, one and two months after ringing; 8 were ringed in summer as adults, young and nestlings, and of these, 6 were found in or near the same place in the following winter, 1 ringed at Inverurie, Aberdeen, August 23rd, 1910; at Melvich, Sutherland, February 12th, 1912—107 miles N.N.W., and 1 marked in May in the same place in May two years later. These should be compared with the tables in the present paper.

Second Interim Report (1912-14), *Scottish Naturalist*, 1915, p. 315. 12 recoveries of little interest, in or within 5 miles of the place of marking; 11 of them in about two months, and 1 after eight months.

(i) *MARKED AS NESTLINGS OR YOUNG BIRDS
between April and August.*

36 recoveries (6 not included in the table).

<i>Year of bird's life (beginning from April 1st of bird's first year.</i>	<i>(A) Recovered at or near place of marking.</i>		<i>(B) Recovered more than 10 miles from place of marking.</i>	
	<i>April/Sept.</i>	<i>Oct./March.</i>	<i>April/Sept.</i>	<i>Oct./March.</i>
1st year ...	2	10	—	6
2nd year ...	3	3	1	—
3rd year ...	3	—	—	—
4th year ...	—	2	—	—

Details of (B) in the above table.

<i>Number.</i>	<i>Date of marking.</i>	<i>Where marked.</i>	<i>Date of Recovery.</i>	<i>Place of Recovery.</i>	<i>Distance.</i>
B.57	20.6.10	Cheadle, Staffs.	2.4.11	Le Catelet, Aisne, France	335 m. S.E.
5073	24.6.11	Torrance, Stirling	4.12.11	Cove, nr. Aberdeen	110 m. N.E.
81014	17.5.16	Lytham, Lancs.	10.16	Badminton, Glos.	155 m. S.
JN.34	14.5.21	Southport. Lancs.	3.22	Marygate, York.	85 m. E.N.E.
A.8718	20.7.23	Streatham, London.	19.12.23	Lower Ed- monton, London.	14½ m. N.
F.9852	5.28	Penrith, Cumb.	<i>circ.</i> 26.12.28	Maryport, Cumb.	30 m. W.
H.2682	6.29	Langwathby, Cumb.	19.1.30	Peacehaven, Sussex.	290 m. S.S.E.
Aberdeen Univ.	23.8.10	Inverurie, Aberdeen.	<i>circ.</i> 12.2.12	Melvich, Sutherland.	107 m. N.N.W.

AU.799A (age not stated).

(ii) *MARKED AS ADULTS IN SUMMER—April to
August.*

55 recoveries (17 not included in the table).

<i>Year of marking (dating from April 1st of year of marking).</i>	<i>(A) Recovered at or near place of marking.</i>		<i>(B) Recovered more than 10 miles from place of marking.</i>	
	<i>April/Sept.</i>	<i>Oct./March.</i>	<i>April/Sept.</i>	<i>Oct./March.</i>
1st year ...	17	7	—	1
2nd year ...	8	4	—	—
3rd year ...	1	—	—	—

Details of (B) in above table.

<i>Number.</i>	<i>Date of marking.</i>	<i>Where marked.</i>	<i>Date of Recovery.</i>	<i>Place of Recovery.</i>	<i>Distance.</i>
J.201	19.4.13	Sandhoe, Northumb.	—.2.14	Seaham Harbour, Durham.	35/40 m. E.

(iii) *MARKED AS ADULTS IN WINTER—November to March.*

154 recoveries (37 not included in the table).

Year of marking (dating from October).	(A) Recovered at or near place of marking.				(B) Recovered more than 10 miles from place of marking.			
	Oct.	March.	April	Sept.	Oct.	March.	April	Sept.

1st year	...	44		28	—			3
2nd year	...	30		2	2			—
3rd year	...	11		1	—			1
4th year	...	2		—	—			—
5th year	...	1		1	—			—
6th year	...	1		—	—			—

Details of (B) in above table.

<i>Number.</i>	<i>Date of marking.</i>	<i>Where marked.</i>	<i>Date of Recovery.</i>	<i>Place of Recovery.</i>	<i>Distance.</i>
B.9136	3.3.25	Frandlely, nr. Gt. Bud- worth, Ches.	5.12.25	Selby, Yorks.	70 m. N.E.
E.9649	3.3.27	do.	14.6.27	Hale, nr. Liverpool, Lancs.	11 m. N.W.
E.9546	28.1.27	do.	21.4.29	Sale, Ches.	12½ m. N.E.
H.3890	26.1.29	do.	Late 2.30	Ferryhill, Durham	107 m. N.E.
H.4028	5.3.29	do.	2.6.29	Kirkdale, Liverpool.	21 m. N.W.
J.5062	22.3.30	do.	circ. 20.4.30.	Nr. Walsall, Staffs.	55 m. S.S.E.

EXTENT AND DIRECTION OF MOVEMENT.

In dealing with the tables drawn out above, the recoveries of birds in or near the same place would appear to be overwhelmingly more numerous than those at any distance from the place of marking, and though this is significant too much stress must not be laid on it; all, or practically all, those marked as adults were, of course, trapped, and Greenfinches, more than most birds (as will be seen later), will return time

after time to the same trap and thus be noted as recoveries and at the same time at any trapping station ringed birds are expected and examined, whereas other records depend on casual recoveries, many of which doubtless are never reported in the proper quarter.

TABLE (I). MARKED AS NESTLINGS OR YOUNG BIRDS.

To these the above objection does not really apply, as comparatively few of the recoveries have been made by retrapping and the results give a real and unbiassed idea of the birds' movements after leaving the nest.



Sketch map to illustrate movements of Greenfinches ringed as nestlings and young birds. (See Table i, B.)

By far the most remarkable recovery was made in N.E. France, 335 miles S.E. from the nesting-place; strangely enough, it was the first marked Greenfinch recovered under the *British Birds* Scheme and it is still the only one found outside Great Britain!

It will be seen from (i) (B) that there are two other instances of a decided move south in winter, but of the other records

in this table only one is really notable—the discovery in November 120 miles N.E. of its nesting-place of a bird ringed near Glasgow ; this bird was one of eleven in Table (i) which were marked there, most of which were found within three to four miles and one within ten miles of their place of origin.

All other recoveries were made within five miles of the place of origin. This gentle scattering apparently starts and proceeds as soon as the birds are fledged ; youngsters have been caught and ringed and recaptured several miles away during the same month. That they do not always nor even usually leave the district in which they were hatched is manifest, and out of thirty recoveries ten were made in the same district in the ensuing winter, and others in later summers and winters. The statement in the *Practical Handbook* that “many home-bred birds emigrate September and return March” is certainly not borne out by these records.

TABLE (II). MARKED AS ADULTS IN SUMMER.

With the one exception of a bird found forty miles distant all recoveries in this group were made in the place where they were originally captured.

It is easy to draw a false conclusion from this. We have seen that nestlings disperse to some extent when fledged, and anyone who has noticed the local increases and movements which are still going on in May cannot doubt that some movement, however local, of the adult nesting birds takes place.

From the analysis, however, it is clear that a good proportion of the nesting adults do not leave the neighbourhood of their summer quarters, but stay there throughout the winter.

TABLE (III). MARKED AS ADULTS IN WINTER.

Trapping has been practised far more diligently in winter than in summer and an undue number of recoveries have therefore been made in the winter season, but I have in Cheshire continued to trap throughout the year, using in summer no traps of the automatic type but only those that may be closed by the ringer at will (thus avoiding the possibility of keeping nesting birds from their nests for more than a couple of minutes), and one or two other ringers have retrapped a few in May and June.

If this had not been done the recoveries in this table must have given a totally false estimate of the birds' distribution subsequently, and particularly in the summer months.

Birds recorded in this table were marked mainly in about six centres : over 80 individual birds in a trapping station in

Cheshire, 19 at the Oxford Trapping Station, and small numbers in Northumberland, Durham, Surrey, Wiltshire, Devon and various scattered localities.

Of all these marked in winter only six were found at an distance from the place of marking (iii) (B)—3 in summer 11 to 21 miles distant; 1 in less than a month in early spring 55 miles to the S.E., and 2 in the next winter 70 and 107 miles to the N.E. No other bird has been recovered more than 4 miles from its place of marking.



Sketch Map to illustrate movements of Greenfinches marked as adults. (See Table iii, B.)

It will be noted (iii) (A) that a considerable number was recaptured in the first summer after trapping (this number, it is true, includes some birds marked in March and recaptured in April), and though even more were recorded in the next winter, that is no doubt partly accounted for by their greater readiness to enter traps in cold weather.

All this points to the probability that our wintering Greenfinches are largely part of a sedentary resident bird population, but records other than those of marked birds must be taken into consideration. Greenfinches have long been shown to be immigrants to our islands, and in the *Practical Handbook* these movements are concisely given. In the *Reports on the Migration of Birds* (1879-1887) by Messrs. J. A. Harvie-Brown, W. Eagle Clarke, etc., are many records of their arrival on the east coasts of Scotland and England, and at the lighthouses, mainly in October, and some throughout the winter months. In his *Studies in Bird*

Migration (1912) Eagle Clarke gives as their usual date of arrival from October 13th to November 26th (Vol. I., p. 158) and suggests (p. 51) Scandinavia and north Russia as probable summer haunts; he also details immigrations to various islands. From Gaetke's *Heligoland* we learn that in that island they migrate principally in December, January, and February, and appear in great numbers after heavy snowfall or frost on the Continent—as if unwilling to leave their homes until forced to do so. Riviere, in his recently published *History of the Birds of Norfolk*, states that considerable numbers arrive on the coast in autumn, chiefly in October, and that many of these pass along the coast-line to the south.

It would appear that few of these immigrants have been trapped and marked, and the capture of a number on the coast of Norfolk or Lincolnshire would no doubt give valuable results, and show among other things whether these immigrants winter in our islands or are merely birds of passage.

In Cheshire at least there is very considerable movement during the winter months; Greenfinches form part of wandering hordes of small birds scattered in flocks over the countryside, and trapping confirms this; throughout December and the first five months of the year fresh birds continue to enter the traps and to pass on, and it is possible to catch in one spot perhaps a couple of hundred in two or three months and still to have fresh ones arriving daily.

Yet it seems proved from our records that this wandering is largely local and rarely extends for more than a few miles; two alone of Table (iii) (B) can possibly have been birds intending to leave the country, and probably such a guess draws a wrong conclusion.

Proof seems definite enough that some, at least, never leave their native place at all. One example in particular calls for special notice:—

D3233, ringed in Cheshire in November, 1925, was recaptured in January, May and December, 1926; January, May, November and December, 1927, and in February, May, June and December, 1928. Another was recaptured nine times during three consecutive winters.

On the other hand, I have noted on a number of occasions their recapture on almost exactly the same day a year or more later, though not on any intermediate date. Thus:—

A9343, first caught Cheshire, February 24th, 1924; recaptured February 22nd, 1926, and February 21st, 1929, and on no intermediate dates.

B9164, first caught Cheshire, March 9th, 1925 ; recaptured March 8th, 1927, and on no intermediate dates and there are several other cases from Branscombe, Devon and Malvern of their recapture almost exactly twelve months later.

It may be that these wandering flocks tend to visit certain feeding-grounds as conditions prove suitable, and that this occurs much at the same date each year.

Investigation of these problems would be made much easier by the setting up of more trapping stations ; in these there would be a good chance of catching birds marked at other stations, and at least of getting additional evidence of local movements in this country.

CONCLUSION.

From these tables, then, we come to the conclusion that our Greenfinches are largely a sedentary race, scattering over a very limited area after breeding, and that there is also slight evidence (based on three records only) of a tendency to move south in winter.

Much more trapping of adults in winter is, however, necessary in order to increase our knowledge of the movements of autumn and winter immigrants after they reach our shores.

ASSOCIATION WITH ONE ANOTHER.

Another fact these records show is that to some extent Greenfinches join the same flock or can be found in the same company after the lapse of a year.

For example, two marked on the same day—December 23rd, 1928, were recaptured on the same day—January 12th, 1930 ; it is not certain that they kept together throughout the period as only one of them was caught (in January and May, 1929) during the intermediate months. Two others caught on March 3rd, 1925, were recaptured on January 13th and 14th, 1926, but never between those dates.

Careful note should be taken of the ring-numbers of birds actually caught together, and this has not yet been done regularly enough to show any definite result.

That the flocks break up and scatter can also be shown from these two records :—

B9134, Cheshire, marked March 3rd, 1925 ; recaptured December 16th, 1925, 4 miles to E.

B9136, Cheshire, marked March 3rd, 1925 ; recaptured December 5th, 1925, 70 miles to N.E.

where the near coincidence of the dates of recovery is noteworthy.

AGE.

Ringling will ultimately give an idea of the ages birds attain, and already some data on this have been published (*cf. antea*, Vol. XX., pp. 71-73). Tables (i), (ii) and (iii) show that a fair number of Greenfinches survive at least three years, and the greatest age so far recorded is that of a bird marked in Cheshire, February 24th, 1924, which was still alive on February 21st, 1929. At the latest it will have been hatched by August, 1923, and must have been at least $5\frac{1}{2}$ years old when last seen.

HOMING.

Anyone who has trapped birds to any extent will have been troubled by certain individuals of several species which continually visit the traps. The Oxford Trapping Station put such Greenfinches to good use by conducting a series of experiments on their ability to return to these traps from a distance (*antea*, Vol. XXI., pp. 292-293). Five birds were used, and three of them were released at varying distances on different days and from different directions. One of them was released no less than five times, and in each case was retrapped very soon, though on the two last occasions it had been released $6\frac{1}{2}$ miles N.W. and $6\frac{1}{2}$ miles S.W. of its place of capture. Another bird returned from distances 4 miles W., $6\frac{1}{2}$ miles N.E. and 9 miles E., and in the first and last cases was recaptured on the day following its release. It is perhaps significant that one released 13 miles distant was not retrapped.

Another interesting experiment was carried out by Mr. P. E. A. Morshead at Branscombe, Devon, on December 23rd, 1930. He caught forty Greenfinches, and lacking rings enough to mark them all, took them to his home three miles over the hills and released them at 11 p.m. in his garden, where they at once roosted in the bushes and ivy. At noon on the following day he retrapped four of them in the farmyard in which he had first caught them, though there was a very suitable farmyard within twenty yards of their enforced roosting-place.

These two experiments, as Messrs. Nicholson and Willson point out, show that Greenfinches possess either an accurate knowledge of a great area of the countryside or a wonderful homing sense. That they possess the former is indeed probable; the tables drawn out above prove that the species is undoubtedly sedentary to a great extent within a radius of 5 to 10 miles, and obviously their wandering habits in this area must make a great part of it familiar to them.

NOTES

RED-BACKED SHRIKE IN CORK.

AN immature Red-backed Shrike (*Lanius c. collurio*) was killed striking the lantern at the Fastnet Rock, co. Cork, at 3.30 a.m. on August 30th, 1930; the wind at the time was light, from N.E. The specimen was sent to me in the flesh by Mr. P. J. O'Connor. This is the sixth Irish record, five of which are from light-stations, two of these being from the Fastnet.

G. R. HUMPHREYS.

POSSIBLE COURTSHIP FLIGHT OF LONG-TAILED TIT.

IN the spring of 1930 I was fortunate enough to witness what seemed to me to be a sort of love flight of a pair of Long-tailed Tits (*Ægithalos c. roseus*). It took place amongst some lichen-covered thorn bushes in the New Forest.

The two birds kept flying round and round, in and out of the thorns; the one following every twist and turn of the other. It was, however, no mere chase of one excited bird after another; the flight was slow, fluttering and almost moth-like and seemed more like a quiet little game of follow-my-leader. Another feature was the silence of the whole thing, the only sound was an occasional fluttering of a wing against a twig.

After a few minutes they danced off further into the wood and I lost sight of them.

PETER L. DAY.

BLACKCAP WINTERING IN WARWICKSHIRE.

It may be worth recording that a Blackcap (*Sylvia a. atricapilla*) has been continuously haunting my garden at Allesley throughout the late autumn and the winter of 1930. I had frequently heard the call-note of a *Sylvia* about my shrubberies and those of my neighbour's garden, but had been unable to get a proper sight of the bird till February 13th and 27th, 1931. The bird is a female, and on the two dates mentioned I got a view, in good light, of the chestnut cap.

H. W. MAPLETON-BREE.

SWALLOW BREEDING ON FOULA, SHETLANDS.

A FEW instances of the breeding of the Swallow (*Hirundo r. rustica*) in the Shetlands are on record (cf. *Vert. Fauna of the Shetland Isles*, p. 85; *Brit. Birds*, Vol. VIII., p. 200, etc.).

On July 6th, 1924, I saw a nest built on a beam in a stone outbuilding on Foula and the birds were hawking about the place. I did not examine the nest, which probably contained young birds.

J. BISHOP.

NIGHTJAR IN SHETLANDS.

IN the *Vert. Fauna of the Shetland Isles* (1899) a few records of the Nightjar (*Caprimulgus v. europæus*) are given, chiefly from Unst, and Misses Baxter and Rintoul in *Geographical Distribution and Status of Birds in Scotland* (1928) class it as an "Occasional visitor to the Shetlands."

During a visit to Foula in 1924 I heard a Nightjar "churring" on the nights of July 5th and 6th on the high hillside, and was told by the inhabitants that it had been heard and seen there for at least two years previously.

The Landrail (*Crex crex*) occurs annually at the south end of the island and I heard one calling on several occasions from a patch of oats and rank vegetation, where it was probably breeding. It was present in this district both in July, 1924, and also in June, 1925, and 1926.

J. BISHOP.

BEWICK'S SWAN IN ESSEX.

HEARING from Mr. H. A. Littlejohn that a wild Swan had been seen on the lake in Wanstead Park, I went to Wanstead on March 3rd, 1931, and found that the bird was a Bewick's Swan (*Cygnus bewickii*).

It was with a number of Mute Swans on the pool beneath the sandhills at the east end of Wanstead Flats. The bill patches were yellow and the bird was mature. It allowed observation at close range, 20 yards or less. Mr. W. E. Glegg joined me later in the day. On the following day, when the bird was seen by Mr. F. R. Finch, Dr. G. Carmichael Low, and Mr. A. Holte Macpherson, it had become very tame and allowed observation at a distance of a few feet.

Mr. Littlejohn informs me that the bird was first noticed by Mr. B. Causton on the Flats pool on February 5th and that it was at first rather wild. It is said to have come with five other Swans (probably Mutes) from the direction of Epping Forest.

On February 21st the bird visited the Perch pond in Wanstead Park, but it returned to the Flats pond on the same day. On March 9th it left the neighbourhood, but was again seen on the Flats pond on March 17th, and at the time of writing (21st) it is still there.

J. P. HARDIMAN.

IMMATURE GOLDENEYE DRAKES IN MIDDLESEX
THROUGHOUT SUMMER, 1929.

IN the spring of 1929 the main body of the Goldeneye (*Bucephala c. clangula*) at the Stanwell Reservoir seemed to linger rather later than usual, not moving off before the third week of April. On the 17th there were many, with a sprinkling of old drakes; by the 28th I could find no more than four, all told. After that I saw none and decided that they had all moved north.

But on May 19th, when of course I was not thinking of Goldeneye, I noticed a stiff-tailed duck diving in the south reservoir. It showed as hardly more than a silhouette, for it was working in a blazing sun-path, but I was sure that it had a brownish back and some white about the front half of its face. I thought it might possibly be a female Common Scoter, till it flapped its wings, showed white secondaries, and I knew it for a Goldeneye.

On May 29th, I got a good view of two immature Goldeneye drakes in company and noted that they had dark brown (not black) heads with white face-spots, sides mottled grey and whitish, and dull yellow eyes. They kept apart from the other waterfowl and were readily distinguished from one another, as one had a marked notch in the outline of his occiput.

By July 28th they had become very sombre in colour and had lost their face-spots; their sides, so far as I could see, were uniformly coloured and without any white. I noted that the colour scheme reminded me of that of a Grey Lag-Goose.

On August 11th I saw them both together. On August 18th I noted, "the swimming bird shows no white anywhere except an inconstant spot or two on the wings; even the centre of the breast is not white but yellowish-grey. The sides are faintly mottled with a small pattern. The upper parts are brown—brownier than they would be in the adult female. Head very dark brown with no trace of a face patch. Tail is thin and ragged." I timed eight consecutive dives of one bird that day and found that all except the eighth were over forty seconds.

I saw a single bird on August 25th, September 3rd and October 9th; this last I accepted as one of the laggards, his behaviour and position on the reservoir supporting this view, but after that I knew the fresh autumn arrivals were due and I made no further note till I saw the first old drake in full breeding dress on October 20th.

As these two birds were not always visible at Stanwell and retained their powers of flight, one may assume that they visited the other reservoirs on the west side of London. In support of this there were reports of "female" Goldeneye seen at Putney and other places throughout that summer. Their presence was also important in that it vitiated the dates given by some observers for the autumn arrival of the Goldeneye (September 3rd was one such that is open to doubt).

As I do not know of any cases of the Goldeneye remaining in the south of England in the summer months, the above appears to be worthy of putting on record. DONALD GUNN.

RED-BREASTED MERGANSER IN MIDDLESEX.

As we were leaving Staines Reservoirs in the afternoon of February 19th, 1931, we noticed a Merganser (*Mergus serrator*). It was a red-headed bird, either female or immature male, and was quite alone within 100 yards of us. The water was dead calm and the light good, and we were able to watch it from two points and note its dark upper-parts, which, with its slimmer shape and more mottled upper-breast, made it very distinct from the Goosanders, of which there were a number in another part of the water.

Mr. W. E. Glegg, in his List of the Birds of Middlesex (*London Naturalist*, 1929, p. 25), gives only three occurrences of this species since 1866.

H. F. WITHERBY.

E. P. LEACH.

SHAG IN MIDDLESEX.

On February 18th, 1931, at the Stanwell Reservoir near Staines, I saw a Shag (*Phalacrocorax graculus*). It was washing vigorously, and when that was finished it rose and flew to the northern tower, where it perched and did its toilet; after which it fished round the base of the tower till I went away. It was quite indifferent to my presence, so I was able to walk to within thirty yards and watch it through my telescope at my leisure.

My identification rests upon the following points. It was obviously too small and too lightly built to be a Cormorant. The feathers on the front half of its crown stood well above those of the back half. It had no trace of mane, filiform head plumes, thigh patches, or white cheeks other than some dull speckling. It always dived by leaping clear of the surface and plunging, like a Coot.

I judged it to be an immature bird as I could see no green shade anywhere in its plumage. Seen from behind it was, broadly, a mixture of dark and light browns; below it was irregularly washed with dirty cream or stone-coloured yellowish whites, the most solid area of colour being the thighs and flanks, which were dark chocolate-brown. The only pure white was the chin. Bill greenish-grey, yellower at the gape. Iris dull and dark, but in some lights I thought I saw a shade of dusty blue.

The only other Shag I have seen on fresh water was one which spent the winter of 1926 at Oxford, diving in the pool just above Folly Bridge. That bird was in all respects similar to the one I am now reporting. I am told that there are very few records of the Shag having been seen in the county of Middlesex, so I send this note. DONALD GUNN.

[We have also heard from Mr. E. L. King that he saw a bird, which he identified as a Shag, flying low over the Staines Reservoir on February 18th.—EDS.]

THE BLACK-NECKED GREBE IN SOUTH WALES.

THE important and interesting discovery of a large breeding colony of Black-necked Grebes (*Podiceps n. nigricollis*) in west-central Ireland recorded recently (*antea*, p. 170) immediately revives the question that has always exercised our minds as to where the birds seen in South Wales from autumn to spring really come from. We had in the past assumed that they were either visitors from the Continent, or possibly from the small colony in North Wales, but it would now appear quite possible that they may come from Ireland.

The history of the species in South Wales, as far as we can trace it, is as follows.

Apart from a statement in Mathews' *Birds of Pembrokeshire*, 1894, that several had been secured on the Pembroke river by Mr. Tracy—this would be about 1850 to 1865—the first definitely recorded specimen was shot on Llangorse Lake, Brecknockshire, on August 28th, 1912. The next record was not made until nine years later, when we recorded the first Glamorgan specimen on October 29th, 1921, and since then the following have been observed in that county:—

Two February–April and one September, 1922	...	3
One January and two December, 1923	...	3
Two February–March and one December, 1924, to		
January, 1925	...	3
One February and five December, 1926	...	6

Four. September–November and two December, 1927	6
One February–April, 1928	1
One July–August and three December, 1929	4
One October and one December, 1930	2

There is one record from Monmouthshire of a bird now in the Newport Museum which was shot on the Ynysfro Reservoir in September, 1923, and in 1922 or 1923 Sir Thomas Lewis told us that he had seen one on Llangorse Lake, Brecknockshire, in the summer, in full breeding plumage, but no further records seem to have been made from this locality.

It would appear from information supplied by Professor J. H. Salter, that the first and only records for Cardiganshire were made in 1929, when two were seen on the Dovey Estuary in January and one on the Old Harbour, Aberystwyth, in March, while Mr. Bertram Lloyd informs us that the only recent records from Pembrokeshire are of two seen by him at Angle, Milford Haven, December 12th, 1925, and a doubtful hearsay one of two at the same place this winter (1930).

There are no records from either Carmarthenshire or Radnorshire, but it must be borne in mind that reliable observers in South Wales, and especially in these two counties, are few and far between, and that seeing that the birds occur so regularly in Glamorgan where they are looked for, it is more than likely that they are equally regular all round the coast.

Perhaps these notes will fill a gap if any inquiry is made regarding the increase of this species, both as a winter visitor and also a breeder, in Great Britain and Ireland. It is significant that it is not until 1921 that it appears in any numbers or with any regularity in South Wales.

GEOFFREY C. S. INGRAM.
H. MORREY SALMON.

GREY PHALAROPE IN GLOUCESTERSHIRE.

A GREY PHALAROPE (*Phalaropus fulicarius*) obtained on the river Windrush, near Naunton, Gloucestershire, on November 30th, 1929, was sent to me for identification. It was an immature bird, moulting into first winter plumage. Dr. O. H. Wild, to whom I sent it, kindly confirmed my identification. This is, I believe, the third record for Gloucestershire.

A. G. TAYLER.

GLAUCOUS GULL IN KERRY.

A MALE Glaucous Gull (*Larus hyperboreus*) in immature plumage was shot at Portmagee, co. Kerry, on December 10th,

1930, by Mr. D. J. O'Connell, and sent to me in the flesh for identification. G. R. HUMPHREYS.

ICELAND GULL IN SOMERSET.

ON March 2nd, 1931, I saw an Iceland Gull (*Larus leucopterus*) on the largest of the Bristol Water Works Company's reservoirs at Barrow. On February 28th there had been cold winds from the north with snow. I only know of three previous records from the county, namely, specimens obtained at Weston-super-Mare on December 24th, 1870, and at Somerton on December 12th, 1880, and one seen at Minehead on April 14th, 1913. The bird I saw had very white plumage, and the bill had a broad dark tip, the base appearing to be greenish-yellow. It was evidently not mature, and I should judge that it had been hatched in 1929 and so was approaching the plumage of the second summer. It was in company with Herring- and Lesser Black-backed Gulls. F. L. BLATHWAYT.

STARLING BREEDING IN DECEMBER.—The Rev. H. M. Livens informs us that during the last days of December, 1930, which were cold and stormy, a pair of Starlings (*Sturnus v. vulgaris*) nested under the corrugated iron covering an old thatch of a barn-roof at Mr. Starke's Farm, Colwell Bay, Isle of Wight. On or about January 7th the parents were observed by the farm hands bringing in food. On January 11th one of the men went up a ladder and fingered the four or five unfledged nestlings, which appear to have flown on January 31st. The feeding of the young by the parents was watched by the farmer and his staff up to January 30th.

LITTLE OWL FEEDING ON EARWIGS.—Mr. Peter L. Day writes from near Blandford, Dorset, where Little Owls (*Athene n. vidalii*) are very plentiful, stating that a casting he examined contained remains of a great number of earwigs. Mr. Day also states that he has noticed that Little Owls' pellets, when chiefly composed of beetle remains, frequently also contain pieces of moss.

GREEN SANDPIPER IN DUMFRIESSHIRE IN WINTER.—Mr. H. S. Gladstone has sent us a Green Sandpiper (*Tringa ochropus*) which was shot on February 17th, 1931, on Bowhouse Merse, Caerlaverock, and sent to him for identification by Mr. G. Robson.

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THE BEHAVIOUR OF STARLINGS IN WINTER.

BY

V. C. WYNNE-EDWARDS.

II. OBSERVATIONS IN SOMERSET, 1929-30.

SINCE my first paper* on this subject was written, a considerable body of facts has been collected relating to the roosting-habits of Starlings (*Sturnus v. vulgaris*). In Devon and Cornwall, where the earlier investigation was carried out, Mr. A. H. Machell Cox has continued his work, and it is hoped that his results will ultimately be published.

During the autumn of 1929 I made a survey of the Starling roosts in the Bristol area, similar to that made in Devon and Cornwall, but on a much smaller scale. The symbols used in the map (Fig. 1) are the same as those employed

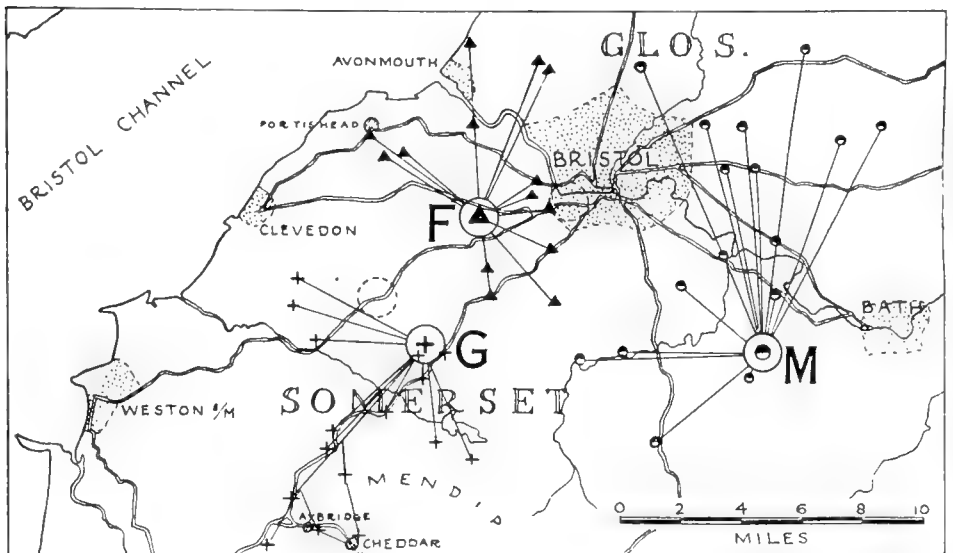


FIG. 1. Map of Bristol area, showing Starling roosts and feeding-areas, 1929-30.

previously. Each roost is represented by a circle with a sign in the centre of it; the same sign is used to mark all points at which flights have been seen, either going to or coming from that roost at dusk or dawn. Thus, the distribution of these signs gives a somewhat deficient picture of the feeding area corresponding to each roost. The population of these Somerset roosts was much less than the average for those in Devon, partly because the feeding areas were smaller,

* See *British Birds*, Vol. XXIII., pp. 138-153 and 170-180.

and also to some extent because the actual density of the Somerset Starling population does not appear to be as great as that in Devon.

Table I. gives in concise form the details of the roosts found. One of these—that at Failand—was selected for intensive observation in connection with other work which was being undertaken.

STARLINGS AND REDWINGS.

In the first paper two cases were given of roosts originally tenanted by Redwings (*Turdus musicus*) being invaded by Starlings. These were at Huish, near Torrington, and at Colwill Farm (B₅), near Plymouth. In the former case the Redwings were driven away altogether, and in the latter they had to find what cover they could in the gorse and bushes around the plantation.

Two additional cases were observed last year in Somerset. I was lucky enough to be at one of these Redwing roosts on perhaps the second or third evening of the Starlings' invasion, and I was able to watch the rather dramatic process of expropriation. This was at Goblin Combe on January 19th, 1930.

At 1.45 p.m. a flock of three or four hundred Redwings was seen near Redhill. Shortly after this, and less than a mile further on, we found a fir wood showing evident signs of its use as a roost. Several dead Redwings were picked up, most of them killed by Owls. Whilst we were there, at 2.14, a large flight of Redwings came up from the N.W., circled over the roost, and made off towards the flock we had seen previously. At the time we were at a loss to explain this early arrival of birds in the vicinity of the roost about two hours before the normal time.

On our return to the roost at 3.55 Redwings were coming in fast, and continued to do so till 4.5. All this time they appeared restless, constantly flying from place to place across the deep limestone combe in which the plantation is situated. Quite large parties kept getting up and flying off out of sight, only to circle back again a few minutes later. The source of this excitement was soon apparent. At 4.13 we saw a small compact flock of Starlings come rolling up across the skyline to the south. They got to the roost and, without any warning whatever, swept the whole length of the combe within a few feet of the tree-tops, turned, and swept back again. It was an impressive performance, not least

because of the complete silence of the Starlings. Almost instantly the Redwings were in an uproar, scattering in little bands in all directions. At 4.18 the Starling flock pitched into the roost, and there was hardly a Redwing left. We could see them in the tree-tops and on the hedges up to half a mile away. They did not stay still, however, but almost at once started to collect towards the roost again for a counter-attack. This, however, came to nothing, because by 4.21 many more Starlings were coming in from the south, and the Redwings would not approach them. I noted that at 4.35 the Redwings were still scattered. I saw a Starling go for one of the more adventurous Redwings immediately above my head. The courses of the two birds came diagonally together, but at the moment of impact they swerved strongly apart without touching.

We left the roost shortly before 5 o'clock. The Starlings were all settled in by then, but many of the Redwings were still moving about, though some of them at least were in another plantation a little further up the combe. It was practically dark.

The second case was at the Failand roost. "F₅" (see Fig. 2) was a Redwing roost which the Starlings appropriated early in March. It seems likely that the Redwings act in the same way as a decoy to bring the birds down on their homeward flight. Starlings are quick to make what profit they can out of other birds, which is one of the reasons for their success.

When stationed at the Failand observation point I used to see the Redwings come over from Ashton Watering, and also the Rooks and Jackdaws (*Corvus f. frugilegus* and *C. m. spermologus*) from the Ashton Court rookery. The Redwings were usually ten to fifteen minutes earlier than the first Starling exodus, and the Rooks and Jackdaws from about seven minutes before to a minute or two after, in spite of the fact that they had a mile and a half to fly before they reached the observation point.

MOVEMENTS OF ROOSTS.

It seems unusual for a roost to be occupied without interruption for a whole season. The early autumn roosts are almost always temporary. In general, however, the movements are not very long ones, usually under two miles.

The detailed history of the Failand roost would not be interesting were it not for other observations made at the

same time. The roost was found on November 4th, 1929, in a plantation called Wraxall Piece (see Fig. 2), where the Starlings had arrived six days before (October 29th). I could not discover that there had ever been a roost in that

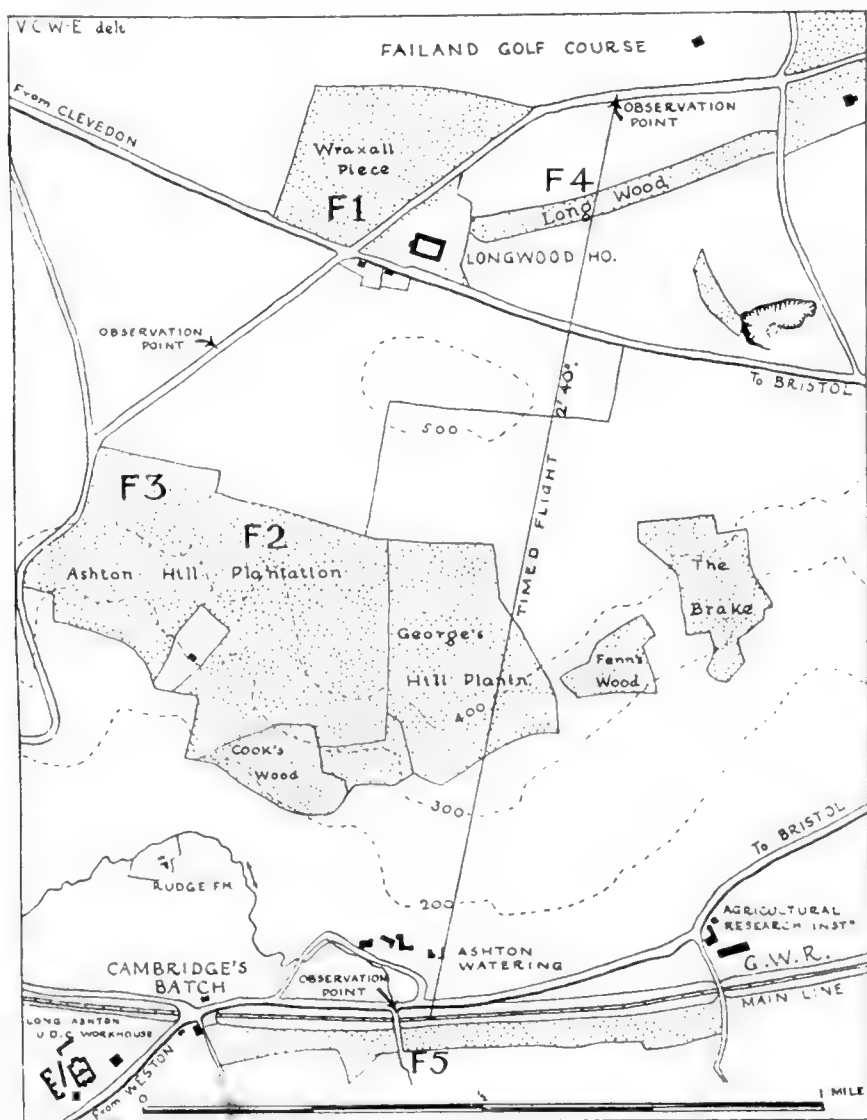


FIG. 2. Map showing the movements of the Failand roost, and the course over which the flights were timed on March 14th.

immediate neighbourhood before, and the sight of tens of thousands of birds collecting was unusual enough to hold up the Sunday golf on the adjacent course. Some days later the Starlings went over to Ashton Hill Plantation, where they remained for the next three months, moving from one section of the plantation to another about 300 yards further west about the beginning of January.

Between February 5th and March 25th I visited this roost thirty-five times at dawn to make light-intensity observations. It very soon became clear that the four large exoduses of birds from the roost were identical day after day, chiefly because of their respective sizes. The first exodus was small in comparison with the second and third, which were very large, accounting between them for three-fourths of the birds. The fourth was smaller again. I do not wish to say that each exodus was composed of a definite set of individuals which remained absolutely unaltered from day to day. I am quite certain that this was not the case. But it is probable that the *majority* of individuals were the same, as will be brought out by the observations to be described. Evidence has already been given to show that the smaller flocks on the feeding-grounds hold together as definite units (*l.c.*, p. 170). It is therefore possible to speak of the "first exodus," etc., as if it were an association of individuals (possibly a loose one) and not a matutinal phenomenon.

On February 28th the third and fourth exoduses were missing—*i.e.*, the population of the roost had been reduced by at least one-half. That it was the third and fourth, and not the first and second exoduses which had gone, is shown by the photometric observations, which enable one to identify the different exoduses by the characteristic light-intensity at the time of their departure.

The same evening a hunt was made for the lost birds, and they were found in Long Wood, $\frac{3}{4}$ mile east of Ashton Hill. That night all but a handful of stragglers roosted in the new place, and the observing point was moved next morning within range of it.

On the morning of March 4th the fourth exodus was missing again. I was not left long in ignorance, however, for $10\frac{1}{2}$ minutes after number three had gone from Long Wood a large flight came high over from the south, which turned out to be the fourth exodus or part of it. The same thing was observed each day until the 11th, when *two* flights came over from the south; both the third and fourth exoduses were missing from Long Wood. This occurred again on the 12th, but on the 13th there were three flights from the south, and only the first exodus and a remnant of the second were left at Long Wood.

That evening a search was made, and the new roost found in a plantation by the G.W.R. at Ashton Watering, $1\frac{1}{4}$ miles south of Long Wood. On the next morning (14th) my wife

was stationed at Ashton Watering, and I went up to Long Wood. We were provided with stop-watches, and timed the flights over a course of 1 mile 700 yards (± 5 yards) in order to establish the interval to be allowed on previous observations of the flights coming over. All the birds were at Ashton Watering on this occasion, but owing to a mistake with the last only three of the exoduses were timed. Each covered the course in 2 minutes 40 seconds exactly to the nearest second. This gives the speed of flight as 31.4 (5) m.p.h., but the course involved a climb of 350 feet. There was scarcely a breath of wind and mist lay in the valley. The sky was cloudless. Observations were made between 6.10 and 6.38 a.m.

From this date until the roost broke up shortly afterwards (March 19th-21st) all the birds resorted to Ashton Watering.

The significant point to notice is that on both occasions when the roost moved it was the last exodus birds which first went to the new place. In the second case a very clear picture was obtained of the gradual movement of the birds, those of the first exodus being the last to move. There is now good reason to believe that the distinctions between the four exoduses lie in the degree of maturity of their reproductive organs. The evidence for this will be set forth in another place, but it is of interest to notice here that this work gives confirmation to the remarkable experiments of Professor William Rowan from a completely different angle. He has shown with birds in captivity that the day-length is the factor which regulates the annual reproductive cycle. By altering the day-length artificially he has been able to manipulate the reproductive cycle so as to produce matured Juncos (*J. hyemalis*) at Christmas, and even to make American Crows (*Corvus b. brachyrhynchos*) migrate northwards in the late autumn. My own work points to the fact that in the case of the Starling in nature, the state of maturity of their reproductive organs influences the birds' day-length, *i.e.*, the time they get up in the morning. This at first sight appears to be a direct contradiction of Rowan's work, but in reality it only serves to show more clearly how closely the day-length and reproductive cycle are correlated. The birds of the last exodus are probably those which will not breed in the ensuing spring; those of the first are the furthest advanced towards maturity.

MANŒUVRES.

In my earlier paper (p. 147) I mentioned that neither Mr. Cox nor I ever saw the manœuvres of the flocks over their roost at nightfall in Devon and Cornwall, though we had been present at roosts on more than twenty occasions at the right time. The most impressive displays of evolutions I have seen have been in Yorkshire in August and September, and at the Marksbury roost, Somerset, on October 2nd. On October 27th at Topsham, Devon, I saw twelve birds, all alone, performing stately and precise movements over a reed-bed from which all their companions had been driven by floods on the Exe three weeks before. This shows that it is not merely the emotional effect of enormous numbers which leads to the manœuvres. On November 10th at Gittisham Hill, Devon, manœuvres were seen but they were short. On December 6th at Ashton Hill "magnificent manœuvres" were seen. Very rarely during January, February and March evening evolutions were seen in Somerset. There is no doubt that they are at their best in the long evenings of the early autumn, and gradually become less and less important, until in Devon at least they do not occur after December. Fine weather is of course essential to the best displays.

DURATION OF THE ROOSTING-HABIT.

A small roost in the Failand neighbourhood, probably in Ashton Park, was used throughout the breeding-season of 1930. Fairly large flights began again about June 17th.

On June 30th the Slapton Ley (Devon) roost was occupied by several hundred birds. This is interesting as a case of a winter roosting-site being used at midsummer.

On July 24th, 1929, there were about a thousand Starlings roosting in the trees below the Citadel, on the front of Plymouth Hoe. Mr. F. R. Horne tells me that this roost has been used in the late summer in previous years. It was also in use during July and August, 1930.

In conclusion, I should like to acknowledge my debt to the University of Bristol for lending me a car in which to visit the roost, and to thank Mr. Machell Cox for suggesting the useful word "exodus" to describe the flights of Starlings from their roost in the morning.

TABLE I.

<i>Initial Letter.</i>	<i>Position.</i>	<i>Altitude. (feet).</i>	<i>Type of Cover.</i>	<i>Remarks.</i>
M	Stantonbury Camp, Marksbury.	500	Conifers.	Moved or broke up a few days before March 8th.
—	Spire of S. Mary's, Redcliffe, Bristol.	—	Niches of masonry.	Joined up with F some time in January.
F ₁	Wraxall Piece, Failand.	450	Mixed larch and deciduous, 10-15 years.	Used October 29th to November 7th or 8th, and November 13th.
F ₂	Ashton Hill Plantation	500	Conifers, c. 15 years.	Used November 9th to 11th, and from November 14th till about New Year.
F ₃	Same, further west (see Fig. 2).	500	Conifers, mostly larch, c. 25 years.	Used after above till February 27th.
F ₄	Long Wood	450	Conifers, c. 20 years.	Used February 28th till March 12th, latterly by a diminishing number of birds.
F ₅	Plantation by G.W.R. at Ashton Watering.	150	Conifers, mostly larch.	First used March 3rd. Finally abandoned March 21st. Formerly a Redwing roost.
G	Goblin Combe, nr. Redhill.		Conifers and hawthorns.	Appropriated from Redwings about mid-January.

BIRDS AT RESERVOIRS IN THE LONDON DISTRICT DURING THE WINTER 1930-31.

BY

A. HOLTE MACPHERSON.

DURING the past few months so many interesting birds have been noticed at the reservoirs in the London district that it seems worth while to mention the chief occurrences. It is a singular fact that the records from Staines have been of far greater interest than those from all the other reservoirs in the district combined throughout the months of December, 1930, and January and February, 1931.

At Staines, this period started with a rich legacy from the last few days of November, during which a number of uncommon birds had arrived, including not less than four Slavonian Grebes (*Podiceps auritus*), a Red-necked Grebe (*Podiceps g. griseigena*), and two Great Northern Divers (*Colymbus immer*). Most of the Slavonian Grebes left early in December, though one remained till nearly the end of the month. It was on December 7th when I last saw the Red-necked Grebe; and on this day Mr. D. Gunn noticed a Kittiwake (*Rissa t. tridactyla*), a very uncommon visitor to these waters. It was in first winter plumage.

One of the two Great Northern Divers appeared to be slightly the larger, and it had on its back one or two dark feathers with white spots. The other, perhaps a young bird, was by December 7th joined by another exactly like itself, while the larger bird had by this time disappeared. On December 13th yet another Diver was discovered, but it kept too far away for identification. On the following day the three Divers were together, and were seen approaching the public footpath, on which were several observers with telescopes. While the birds were still some distance off, Mr. D. Gunn expressed the opinion that one of them was of the Black-throated species (*Colymbus a. arcticus*), and this proved to be the case. The three birds came quite close to the path and gave the observers a splendid view of them. It may here be mentioned that during the first half of December the weather was generally dull and the barometer fairly steady, and there were no violent gales with which to associate the arrival of these birds. Both the Great Northerns stayed till about January 4th, after which one remained till the end of the first week in February. I last saw the Black-throated Diver on January 11th. During its stay of about four weeks, observers who visited these reservoirs enjoyed on various occasions the rare privilege of closely watching

the two species swimming side by side. When thus seen, the more elegant lines and snake-like head of the Black-throated were almost as striking as the far stouter build of the Great Northern species. The measurements of specimens given in books convey no idea of the great difference between these two birds in bulk; but this was well expressed by Dr. G. C. Low, who, one day when we had the birds close to us, exclaimed: "It is like comparing a hunter with a cart-horse." The late Mr. Abel Chapman, in his *Bird-Life of the Borders* (p. 248), states that the weight of a male Black-throated Diver shot by him was 5 lbs. Of a pair of Great Northern Divers the female weighed 8 lbs. and the male 12 $\frac{3}{4}$ lbs. The bird which weighed 5 lbs. was shot towards the end of January. Perhaps it was a bird of the preceding year and was not quite full grown. But, even assuming this, the difference in the weights is enormous. It is easier to realise what the figures mean when we remember that 5 lbs. is barely the weight of a pair of Mallard, and 12 $\frac{3}{4}$ lbs. the weight of two good-sized White-fronted Ganders.

On the afternoon of December 20th I heard a Grey Plover (*Squatarola s. squatarola*) passing over the north reservoir, Golden Plover sometimes fly over these reservoirs and settle on the fields beyond, but the occurrence of a Grey Plover is very rare. The atmosphere was rather thick at the time and the light had begun to fade. I could not catch sight of the bird, but its beautiful call is unmistakable and was repeated many times.

Other outstanding events at Staines were the appearance on February 14th of the first Great Skua (*Stercorarius s. skua*) known to have occurred in Middlesex (*antea* p. 299); followed by the visits of a Shag (*Phalacrocorax a. aristotelis*) seen on February 18th by Mr. D. Gunn (*antea*, p. 341); and a female or immature male Red-breasted Merganser (*Mergus serrator*) (*antea*, p. 341) and a Cormorant (*Phalacrocorax c. carbo*), both of which were identified on February 19th by Miss E. P. Leach and Mr. H. F. Witherby. Both Shag and Red-breasted Merganser are of extremely rare occurrence in the county.

Among countless ducks seen at Staines during the winter I did not notice anything more uncommon than one Scaup (*Nyroca m. marila*) and a few Pintail (*Anas a. acuta*); but mention should be made of the Goldeneyes (*Bucephala c. clangula*) which in February were present in unusual numbers. Sometimes as many as fifty could be counted. One day, in a flock of over thirty, there were three young males showing the white facial spot in different stages of development;

they made a very interesting picture. On several occasions adult drake Goldeneyes were observed displaying to their females. In this graceless performance, the head, after being tossed back till it appears to strike the dorsal feathers, is thrown forward with a jerk of such vigour that the spectator is left wondering why the bird's neck has not been dislocated.

While Staines throughout the winter months was entertaining such a remarkable series of rare visitors, at the other reservoirs in the London district few uncommon birds appear to have occurred, apart from the Black-throated Diver seen in December and January by Mr. F. R. Finch and Mr. W. E. Glegg on "The Racecourse" at Walthamstow (*antea*, p. 296). At Barn Elms, however, a Common Sandpiper (*Tringa hypoleucos*) was frequently observed in December and during most of January. It frequented the borders of the two reservoirs nearest to the Thames, which is only about 50 yards distant from them. It was noticed that at low tide the bird was often absent, from which it is a fair inference that on these occasions it resorted to the foreshore of the river. An adult drake Scaup spent several weeks at Barn Elms; and at Walthamstow on February 15th Dr. G. C. Low and I saw two birds of this species on separate reservoirs. Miss E. P. Leach informs me that for a great portion of the winter there has been a female Scaup on one of the small reservoirs at Molesey, and that in the spring of 1930 she found a female Scaup, perhaps the same bird, at exactly the same place. On all these occasions each of these Scaups was consorting with Tufted Ducks.

Neither Goosanders (*Mergus m. merganser*) nor Smew (*Mergus albellus*) seem to have been quite so numerous on the reservoirs this winter as in recent years, although Miss E. P. Leach and Mr. H. F. Witherby counted thirty-six Goosanders one day at Molesey; and in February Dr. Low and I found a flock of seventeen Smew at Walthamstow, six of them being white males. In the case of both these species an unusually large proportion of adult males has been noticeable. Flocks of Goosanders, of which adult males formed the majority, have been seen frequently. On January 11th, Dr. G. C. Low, Dr. P. H. Manson-Bahr, Mr. F. R. Finch and I watched a charming group of Smew on a small reservoir near Kempton Park; out of ten birds no less than half were white drakes. In most inland counties the occurrence of an adult male Smew is regarded as a very rare event. He is by far the most conspicuous object in any group of birds, for his whiteness has the purity of snow. Compared with his, the white breast of a Gull looks grey.

BIRDS MARKED ABROAD AND RECOVERED IN THE BRITISH ISLES.

THE following have come to our notice since the last list of birds marked abroad was published. As we have in preparation an article dealing with the origin of migrants to this country as revealed by birds ringed abroad, details of any such records known to our readers and not already published in our pages will be greatly appreciated.—H.F.W.

No.	Place and Date Ringed.	Place and Date Recovered.
<i>ROOK (Corvus f. frugilegus).</i>		
Helgoland, 39459	Borkum Is., mouth of R. Ems, Germany, 31.10.27, ad.	North Newbald (East Yorks.), early Dec., 1930, in <i>Naturalist</i> , 1931.
<i>STARLING (Sturnus v. vulgaris).</i>		
Rossitten, F.46927	Rossitten (E. Prussia), 31.7.27.	Barnsley (Yorks.), 14.11.30, by E. G. Bayford.
Riga, Orn. Cent. 20318	Lubahn, Latvia, 5.6.27.	West Looe (Cornwall), 28.12.27, in <i>Lett. Orn. Cent.</i> , 1930.
Ditto 16742	Ditto 14.4.27.	Yarmouth (Norfolk), 14.3.28, in ditto.
Ditto 22687.	Ditto 4.6.27.	Elmstone (Kent), 3.3.29, in ditto.
Ditto 32122.	Ditto 11.6.29.	Patrington (Yorks.), 21.11.29, in ditto and C. H. Wells.
Ditto 23250	Irmlau (Kurland), 7.6.27.	Nr. Brigg (Lincs.), 4.3.29, in ditto.
Skovgaard, Viborg, H.6149	Sönderskov, Alsen, Den- mark, 1927.	Aslocton (Notts.), 15.11.29, in <i>Danske Fugle</i> , 1930.
Ditto H.7772	Lambjerg, Alsen, 1927.	Nr. Plymouth (Devon.), 9.1.28, in ditto.
Ditto G.4308	Rindsholm, nr. Viborg, 1928.	Belford (Northumb.), 24.4.29, in ditto.
Ditto G.4312	Ditto ditto.	Kilmovee (Mayo), 30.3.30, in ditto.
Ditto H.9167	Svenstrup, Jylland, 1927.	Harborough (Warwick.), 15.1.28, in ditto.
Ditto G.9664	Bodilsker, Bornholm, 1929.	Shoreham (Sussex), 20.12.29, in ditto.
Ditto H.7512	Tisvilde, N. Sjaelland, 1927.	Salisbury (Wilts.), 16.4.28, in ditto.
Rossitten, F.75359	Wusterhanse (Pomerania), 5.6.30.	Haverfordwest (Pemb.), 11.12.30, by G. C. S. Ingram.
Mus. Leiden, 88174	Wassenaar (S. Holland), 23.10.30.	Cross Scales (S. Wexford), Jan., 1931, by G. R. Humphreys.

No.	Place and Date Ringed.	Place and Date Recovered.
LINNET (<i>Carduelis c. cannabina</i>).		
Mus. Bruxelles, 3 B.536	Near Brussels, 17.10.30.	Lakenheath (Suffolk), December, 1930, by J. Rolph, per A. W. Boyd.

CHAFFINCH (<i>Fringilla c. cœlebs</i>).		
Mus. Leiden, 68598	Wassenaar (S. Holland), 22.10.28, ad.	Normanton (Lincs.), 16.1.29, in <i>Zool. Mededeelingen</i> , 1930.
Ditto 89404	Ditto 15.10.30, ad.	Newtown, Drogheda (Louth), 27.2.31, by G. R. Humphreys.

CONTINENTAL SONG-THRUSH (<i>Turdus ph. philomelus</i>).		
Helgoland, 653676	Isle of Mellum, mouth of R. Weser, Germany, 15.9.29, young.	Near Diss (Norfolk), 11.3.31, per <i>Cage Birds</i> .

BLACKBIRD (<i>Turdus m. merula</i>).		
Helgoland, 655207	Heligoland, 3.11.28.	Near Brigg (Lincs.), Jan. or Feb., 1930, in <i>Field</i> .
Ditto 81764	Ditto 25.10.30.	Rollsby (Norfolk), 26.1.31, by S. H. Long.

MONTAGU'S HARRIER (<i>Circus pygargus</i>).		
Mus. Leiden, 54662	Den Hoorn, Texel, young, 28.6.28.	S.E. Suffolk, end June, 1929, in <i>Zool. Mededeelingen</i> , 1930.

HERON (<i>Ardea c. cinerea</i>).		
Helgoland, 34538	I. of Mellum, mouth of R. Weser, 10.8.29.	Liss (Hants.), 6.12.30, by W. R. Smith.

TEAL (<i>Anas c. crecca</i>).		
Skovgaard, V.4798	Near Husavik, Iceland, 22.6.30.	Near Abbeyleix (Queen's Co.), 24.12.30, by Miss E. St. Leger.
Mus. Helsingfors, D.2921	Kuusjärvi, S.E. Finland, 29.7.29.	Emsworth (Hants.), March, 1930, by Mr. Prior.
Riga, Orn. Cent., 10964	Near Riga, 11.6.26.	North Fambridge (Essex), 11.2.28, in <i>Lett. Orn. Cent.</i> , 1930.
Skovgaard, Viborg, V.6355	Fanö, Jylland, 7.9.29.	Lixnaw (Kerry), 7.12.29, in <i>Danske Fugle</i> , 1930.
Ditto V.6347	Ditto 6.9.29.	Oxwich (Glam.), 7.12.29, in ditto.
Ditto V.6342	Ditto ditto.	Strangford Lough (Down), 26.12.29, in ditto.
Mus. Leiden, 75211	Oesterland (Zeeland), 26.12.29.	R. Thames (nr. Oxford), 1.3.30, in <i>Field</i> .

No:	Place and Date Ringed.	Place and Date Recovered.
TUFTED DUCK (<i>Nyroca fuligula</i>).		
Skovgaard, Viborg, V.3099	Ove Lake, N. Jylland, 1927.	I. of Lewis (O. Hebrides), May, 1928, in <i>Danske Fugle</i> , 1930.
SCAUP-DUCK (<i>Nyroca m. marila</i>).		
Skovgaard, Viborg, E.1479	Husavik, Iceland, 3.8.30.	Goleen (Cork), 22.10.30, in <i>Shooting Times</i> .
RED-BREASTED MERGANSER (<i>Mergus serrator</i>).		
Skovgaard, Viborg, V.5062	Husavik, Iceland, 29.8.30.	Thurso (Caithness), 29.10.30, by P. Skov- gaard.
Ditto E.1863	Myvatn, Iceland, 4.7.30.	Nr. Inverness, 14.12.30, by P. Skovgaard.
LAPWING (<i>Vanellus vanellus</i>).		
Mus. Stockholm, D.2453	Malmö (S. Sweden), 10.6.29.	Sea Houses (Northumb.), 5.4.30, in <i>Fauna o. Flora</i> , 1930.
Skovgaard, Viborg, X.8659.	Nr. Aarhus, Denmark, 1928.	Lincolnshire, 30.10.28, in <i>Danske Fugle</i> , 1930.
Ditto G.7264	Ditto	1929. I. of May, Scotland, Dec., 1929, in ditto.
Ditto X.1645	Nyborg, Fünen, 1926.	Hornsea (Yorks.), 15.11.28, in ditto.
CURLEW (<i>Numenius a. arquata</i>).		
Mus. Helsingfors, D.5634	Kersava, nr. Helsingfors, 2.6.30.	Frodsham Marsh (Ches.), 26.10.30, by W. Frod- sham, per A. W. Boyd.
Ditto C.1603	Koivisto, Ulvila, S.W. Finland, 27.6.27.	Irvinestown (Fermanagh), 8.10.27, <i>Ornis Fennica</i> , 1928.
Mus. Stockholm, B.2209	Nr. Mariestad (Lake Vener), 10.6.30, young.	St. Mary's, Scilly Is., 8.8.30, in <i>Fauna o. Flora</i> , 1930.
Mus. Leiden, 21689	Vogelenzang, nr. Leiden, 28.5.27, young.	Nr. Holywell (Flint), May, 1929, in <i>Zool. Mededeel- ingen</i> , 1930.
COMMON SNIPE (<i>Capella g. gallinago</i>).		
Mus. Bruxelles, C.6638	Knocke-sur-Mer, Belgium, 4.9.30.	Bodedern (Anglesey), 26.1.31, by A. V. Spicer.
WOODCOCK (<i>Scolopax r. rusticola</i>).		
Mus. Stockholm, A.2091	Abo, Jämtland, Sweden, 2.8.29.	Kenmare (Kerry), 13.11.29, in <i>Fauna o. Flora</i> , 1929.
Ditto A.2274	Ditto	27.6.29, young. Boyle (Roscommon), 13.1.31, by C. Mul- holland.

No.	Place and Date Ringed.	Place and Date Recovered.
SANDWICH TERN (<i>Sterna s. sandvicensis</i>).		
Skovgaard, Viborg, S.620	Hirtsholm (off Frederikshavn), Denmark, 22.6.30, young.	Cowden, Hornsea (Yorks.), 24.8.30, by F. Johnson, per A. Landsborough Thomson.
Ditto S.4378	Ditto 16.7.30.	Scolt Head (Norfolk), 12.10.30, by C. Chestney.

COMMON TERN (*Sterna h. hirundo*).

Mus. Stockholm, D.3607	Nr. Kristianstad (S. Sweden), 15.6.30, young.	Grimsby (Lincs.), 29.8.30, in <i>Fauna o. Flora</i> , 1930.
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BLACK-HEADED GULL (*Larus r. ridibundus*).

Mus. Helsingfors, C.9364	Near Helsingfors, Finland, 1.6.30.	Scarborough (Yorks.), 26.12.30, by W.J. Clarke.
Mus. Göteborg 13326C.	Island of Öland (S.E. Sweden), 22.6.29.	Skipsea (Yorks.), 19.10.30, by Miss M. Cooper.
Mus. Göteborg, 2075C.	Maklappen I., S. W. Sweden, 25.6.27, young.	Whitsand Bay (S. Cornwall), January, 1930, by D. W. Herdman.
Rossitten, E.48747	Nr. Kiel (Schleswig-Holstein), 6.7.29.	Walthamstow (Essex), 15.2.31, by A. Holte Macpherson.
Ditto E.5494	Schleswig (Schleswig-Holstein), 24.6.11.	Weston-super-Mare (Somerset), December, 1930, by R. Kemp.
Skovgaard, Viborg, A.3890	Oreby, Laaland, 1928.	Braintree (Essex), 23.3.29, in <i>Danske Fugle</i> , 1930.
Ditto M.1065	Selsö Lake, Sjaelland, 1927.	Tilbury (Essex), 6.3.30, in ditto, and A. E. Sawdy.
Ditto A.1305	Tipperne, W. Jylland, 1920.	Ditto 16.11.29.
Ditto M.499	Ove Lake, Jylland, 1927.	Barn Elms Reservoir, London, 4.1.30, in ditto, and C. Weeks.
Ditto M.1087	Selsö Lake, 1927.	Blandford (Dorset), 24.3.28, in ditto.
Mus. Leiden, 48681	Texel, 23.6.28, young.	Dukinfield (nr. Manchester), 20.1.29, in <i>Zool. Mededeelingen</i> , 1930.
Ditto 55941	Ditto, 7.6.28, young.	Chesterton Mills, Cambridge, 26.2.29, in ditto
Lotos-Prag, 41371	Hirnsen Lake (N. Bohemia), 24.5.14.	Near Bristol (Glos.), 28.1.15, by H. Tetley.

COMMON GULL (*Larus c. canus*).

Tartu, Estonia Univ. 5444	Tulpe I., Oesel, E. Baltic, 29.6.29.	Scarborough (Yorks.), early 1930, by W. J. Clarke.
Mus. Göteborg, 9667D.	Hallands Väderö (Scania), S. Sweden, 30.6.30, young.	Holme (Norfolk), 19.12.30, by J. F. Thomas.

No.	Place and Date Ringed.	Place and Date Recovered.
COMMON GULL (<i>continued</i>).		
Skovgaard, Viborg, D.2326	Saltholm, off Copenhagen, 1925.	Colchester (Essex), 2.11.29, in <i>Danske Fugle</i> , 1930.
Ditto K.5608	Ditto	1927. Wellington Bridge (Wex- ford), 2.8.28, in ditto.
Ditto D.948	Ditto	1928. Near Southampton (Hants.), 3.8.29, in ditto.
Ditto D.2391	Hirtsholm, off Frederiks- havn, 1928.	Darlington (Durham), 31.12.28, in ditto.
Ditto D.5608	Ditto	ditto Herne (Kent), 17.2.29, in ditto.
Ditto K.6525	Vrøj I., Sjælland, 1927.	Hull (Yorks.), 1.1.28, in ditto.
Ditto D.8471	Ditto	1929. Near Manningtree (Essex), 22.1.30, in ditto.
Ditto D.8842	Ditto	ditto. Walthamstow (Essex), 26.1.30, in ditto.
Ditto D.6015	Ditto	1928. Margate (Kent), 20.5.29, in ditto.
Ditto K.5647	Ditto	1927. Shoeburyness (Essex), 11.11.29, in ditto.
Ditto D.3516	Ditto	ditto. Dover (Kent), 13.12.29, in ditto.
Ditto D.3505	Ditto	1927. Dovercourt (Essex), 15.2.29, in ditto.
Ditto K.2032	Dybsø, Sjælland, 1922.	Thoresby (Lincs.), 27.2.29, in ditto.
Ditto D.1307	Lindholm, N. Coast, Laa- land, 1926.	Saxmundham (Suffolk), 1.3.29, in ditto.
Ditto K.1573	Ditto	ditto. Preston (Lancs.), 5.3.29, in ditto.
Ditto X.4700	Hjælm, off Aarhus, 1924.	Norwich (Norfolk), May, 1929, in ditto.
Mus. Leiden, 42236	Texel, 19.6.26, young.	Boston (Lincs.), 18.2.29, in <i>Zool. Mededeelingen</i> , 1930.

HERRING-GULL (*Larus a. argentatus*).

Mus. Leiden, 25867	Texel, 15.7.25, young.	Filey Brigg (Yorks.), 19.4.29, in <i>Zool. Mede- deelingen</i> , 1930.
Ditto 70955	Texel, 22.6.29, young.	Grimsby (Lincs.), 24.8.29, in ditto.

NORTHERN GUILLEMOT (*Uria a. aalge*).

Helgoland, 41013	Heligoland, 9.7.28, young.	Worthing (Sussex), 12.2.29 in <i>Der Vogelzug</i> .
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MOORHEN (*Gallinula c. chloropus*).

Mus. Leiden, 54617	On Lightship nr. Flushing, March, 1928, ad.	R. Teme, nr. Worcester, 3.2.29, in <i>Zool. Medede- elingen</i> , 1930.
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OBITUARY.

JOHN GUILLE MILLAIS.

THE unexpected death of John Guille Millais, which occurred at Horsham on March 24th, 1931 (his sixty-sixth birthday), following an operation which suddenly became necessary, leaves us the poorer by the loss of a fine naturalist and a gifted and delightful personality.

A man of remarkable versatility and great energy and enthusiasm—naturalist, author, artist, sculptor, traveller, big game hunter, horticulturist, and sportsman—the range of his interests brought him into touch with a wide circle of men of different sets and classes, among whom his kindly and straightforward nature made him a host of friends.

He was one of the oldest members of the British Ornithologists' Union, to which he was elected in 1885, and possessed a large collection of British birds, commenced when, as a boy of thirteen, he wandered with a gun about the east coast of Scotland. These, with a fine collection of big game trophies, were housed in his private museum at Horsham, where the beautiful garden which he formed round his home bears witness to his skill in the culture of the flowering trees and shrubs which he loved so well.

His principal contributions to ornithology were his works on *The Natural History of British Surface-Feeding Ducks*, *British Diving Ducks*, and *The Natural History of British Game Birds*. At the time of his death he was engaged on another book on British birds, dealing especially with their courtship and nuptial display. Of his other publications *The Mammals of Great Britain and Ireland* and his monograph of the Rhododendrons are the most important. These remain as standard and authoritative works on their subjects, while *Game Birds and Shooting Sketches*, *The Wild Fowler in Scotland*, *British Deer and their Horns*, *A Breath from the Veldt*, *Newfoundland and its Untrodden Ways*, biographies of his father and of his friend Selous, a book on Magnolias, and his many contributions to works on big game and shooting were all deservedly appreciated.

The fourth son of the late Sir John Millais, P.R.A., he inherited an artistic talent which he devoted chiefly to painting birds and animals, and to illustrating his books with the coloured plates and spirited drawings which gave them a distinction of their own.

He was educated at Marlborough and Trinity College, Cambridge, and after some previous service in the Militia joined the 1st Battalion of the Seaforth Highlanders in 1886. Retiring from the army six years later, he devoted himself to his own pursuits, but during the War, in which his eldest son, Geoffroy, was killed in action, he was employed on Intelligence Department work in Norway, with the rank of Lieutenant-Commander, R.N.V.R.

He married in 1894 Frances Margaret, daughter of Mr. P. G. Skipwith, who survives him, and he leaves one son, Raoul, also a talented artist, and one daughter.

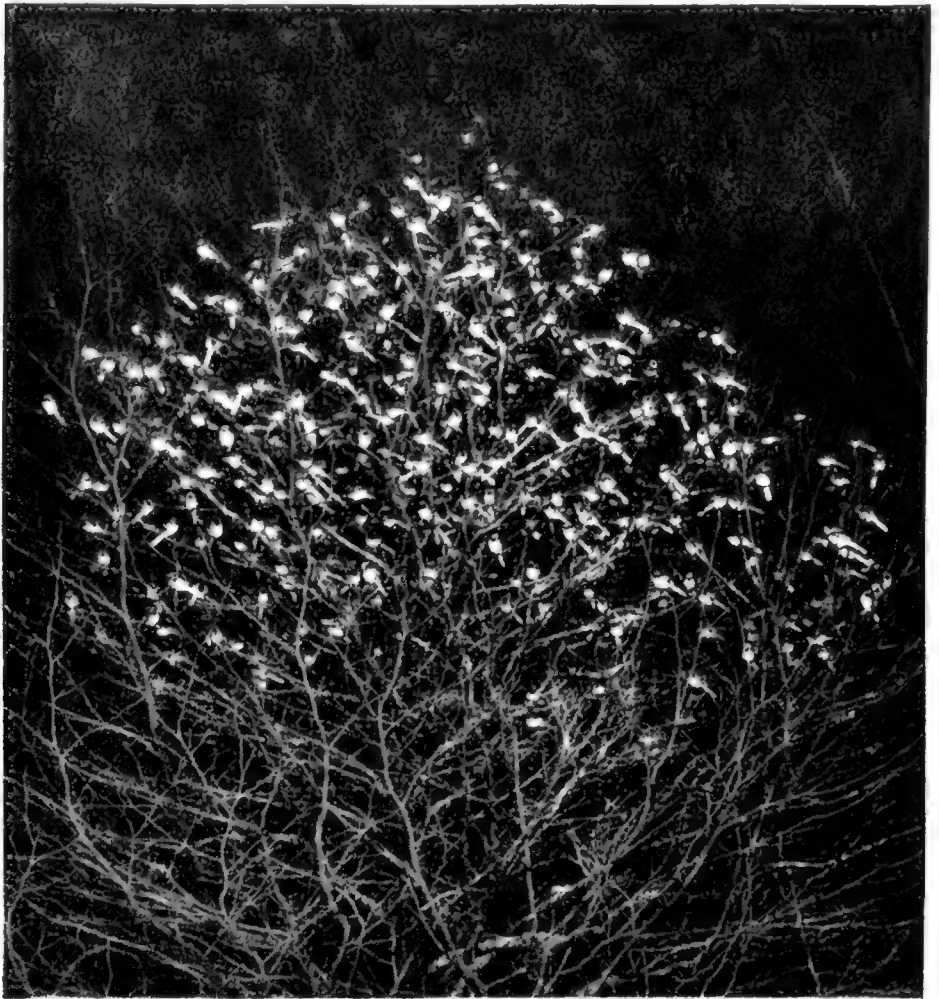
By those who were privileged to enjoy his friendship, "Johnny" Millais will be greatly missed, while many who knew him only from his writings and pictures will have learned of his death with a feeling of personal loss.

A. L. BUTLER.

NOTES

A PIED WAGTAIL ROOST IN DUBLIN.

DURING the whole of the winter of 1930-31 a large number of Pied Wagtails (*Motacilla a. yarrellii*) have assembled to roost every night in a small plane-tree, scarcely twenty feet high, in the centre of Sackville Street (now called O'Connell Street), Dublin, where they have excited much notice and frequently attracted crowds of visitors.



Pied Wagtails roosting in a tree in Sackville Street, Dublin.
From a flashlight photograph taken by Mr. T. Mason in January, 1931.

The tree (shown in Mr. T. Mason's flashlight photograph taken in January, 1931*) not only stands in the middle of a

* We are greatly indebted to Mr. T. Mason for kindly allowing us to reproduce his remarkable photograph.—Eds.

brightly illuminated street, but electric trams run so close (on both sides) as almost to touch it, and at the rate of two to the minute until nearly midnight. The boldness of the roosters was remarkable in many ways, for neither the crowds who gathered every night round this tree nor the tram-cars seemed to disturb them in the least. When Mr. Mason failed on his first attempt to get a satisfactory photograph he tried a stronger flash, and only three Wagtails flew out of the tree, and these very quickly returned.

In the earlier part of the winter of 1929 there was a similar visitation, but after December 2nd the birds suddenly fell off in numbers, only about a dozen birds being in the tree on the 4th and none on the 6th. The desertion is thought to have been the result of ill-treatment by boys.

In the autumn of 1930 the first intimation I had of the Wagtails' return was from the Rev. P. G. Kennedy, who first saw them on October 16th back in the same tree and in about the same numbers. The number of roosting birds in the previous autumn had been estimated at about 100. In November, 1930, it was easily seen to be well over 200, and was guessed to be 300; but on December 24th a remarkably keen observer, Mr. Peter Dunn, watched them as they were leaving the tree in the early twilight between 7.30 and 7.45 a.m. and counted 450 fly out in twos and threes, after which he had to come away, but estimated that there were still 100 to 150 that had not flown. The little tree had, therefore, at the very least been the roost of over 500 birds.

During all the winter months I paid frequent visits to the spot when the birds were due to assemble. In the short days they generally began to alight in the tree twenty (or perhaps oftener twenty-three) minutes after sunset, and then would come pouring in, chiefly in small parties (they gather on the roofs before descending into the tree), for about twenty minutes, when the rush would be at an end. Later in the season in March they often began arriving ten minutes after sunset—perhaps the lengthening days gave them more feeding time than they wanted. As a rule the birds begin to arrive silently, but after the influx has gone on for about ten minutes the crowd bursts into a chorus of twitters, so loud as to be audible for nearly a hundred yards in spite of the noise of the city traffic. The twittering is kept up for about five minutes.

As to the time of their leaving in the morning I can only say that on January 3rd, when Dublin sunrise is due to occur

at 8.40, I passed the tree in a tram-car at 8.25 a.m. and saw "between twelve and twenty of the Wagtails still roosting". These of course would be only the laggards. On December 24th, when Mr. Dunn watched them, they began to leave rather more than an hour before sunrise, which was at 8.41.

The birds seem very late about breaking up for the spring. Their numbers were first seen to be distinctly diminished in the second week of March, and at the end of that week they shifted their quarters into a second plane tree, some thirty yards from the first, which has not been occupied since. On the evening of April 9th I was able to count 283 (probably missing others) as they flew into this tree; on the 12th an attempted count made the number at least 228; on the 15th I saw about 110, and on the evening of the 16th the Rev. P. G. Kennedy informs me that there were only 29, and this was in fact the last night on which any Wagtails roosted in either tree.

C. B. MOFFAT.

NUTHATCH IN CUMBERLAND.

ON January 19th, 1931, a Nuthatch (*Sitta e. affinis*) was shot on the shores of Brother's-water, Cumberland. In Macpherson's *Fauna of Lakeland* and Macpherson and Duckworth's *Birds of Cumberland* there is only one record for the county, and that as long ago as 1782, when two were shot at Armathwaite on May 11th. In the *Transactions of the Carlisle Natural History Society*, Vol. III. (1923), it is recorded that a pair were seen at Boot in January, 1921, so that this year's bird is only the third record for Cumberland. It was an adult male.

H. W. ROBINSON.

FIRE-CRESTED WRENS IN SUSSEX.

SINCE I saw last season at least three specimens of the Firecrest (*Regulus i. ignicapillus*) near Eastbourne, it would be interesting to know whether 1929-30 was a "Firecrest year". Previously I had only seen one and heard of two others in thirty years, but last season I could almost always find one in a certain wood and saw the others in different places six or seven miles apart. The dates I saw the birds were between November 18th, 1929, and March 3rd, 1930. Though I have visited all these localities several times this season I have not seen a single bird, and I am now inclined to revise my first opinion, which was that the Firecrest had been overlooked. None of the birds seen by me were in the company of Goldcrests. One was usually in oak trees, one in furze and one in whitethorn bushes.

E. C. ARNOLD.

FIRE-CRESTED WREN IN NORFOLK.

ON March 21st, 1931, on the edge of a pine wood near the north coast of Norfolk, I watched a Fire-crested Wren (*Regulus i. ignicapillus*). The horizontal stripes across the head and face first caught my eye, even before I realized that the general size and appearance was that of the genus *Regulus*. I was able to get as near as the focussing mechanism of my 8 × Zeiss glasses allowed, *i.e.*, nine yards, and have no hesitation in recording the bird as belonging to this species. The dark line through the eye was most pronounced.

RONALD M. GARNETT.

BUZZARD KILLING LITTLE OWL.

WHILST walking on the headland near my house at Crantock, Cornwall, one day at the end of March, 1931, I saw a Common Buzzard (*Buteo b. buteo*), which was gliding about 30 feet up, suddenly drop to the ground behind a stone wall. I immediately ran up to the wall and looked over, but unfortunately a stone slipped and caused the bird to rise at once, before I could observe it on the ground. On going to the spot from which the bird rose, I found a Little Owl (*Athene n. vidalii*) with its head torn off and lying within a few inches of the body. The body was warm, fresh blood was issuing from the exposed flesh, and muscular action was causing the legs and wings to move, and it was quite obvious that the Owl had been killed by the Buzzard. HUGH H. V. CHRISTIE.

BUZZARDS USING SEAWEED FOR NEST-LINING.

THE pair of Buzzards (*Buteo b. buteo*) which yearly nest on a sea-cliff ledge at Crantock, Cornwall, use a form of nest-lining which is not recorded in the *Practical Handbook*. Instead of the normal fresh green foliage, etc., used by inland birds which I have observed nesting in trees, this pair use both green and red varieties of sea-weed. This is periodically renewed as it dries up.

HUGH H. V. CHRISTIE

MUTE SWAN EATING FISH.

I THINK that there can be no reasonable doubt that the Mute Swans (*Cygnus olor*) on the Lake of Geneva eat fish. I do not know if it has ever been found in the stomach contents when examined, but I have good ocular proof that they do so. As is well known, this lake abounds in vast shoals of fish about 2 ins. in length; these are called in French "Ablette" (*Alburnus lucidus*). These little fish are very sluggish and keep together

in myriads, and I have often watched from the bank above the edge of the lake these Swans dipping their heads a foot or so below the surface and deliberately taking the fish and apparently swallowing them whole. Some fish which are not swallowed float disabled to the surface and are pounced upon by the Black-headed Gulls (*Larus ridibundus*) which are sometimes in attendance on the Swans. I have not heard of this habit as being recorded elsewhere, and in the *Practical Handbook* no mention is made of fish forming part of the food of this species, although it is recorded of Bewick's Swan.

J. B. WATSON.

ALBINO PINK-FOOTED GOOSE IN NORTHUMBERLAND.

AN interesting albino of the Pink-footed Goose (*Anser brachyrhynchus*) arrived on the Northumbrian coast with the main body of wintering geese and has been feeding inland not far from Holy Island for some time. A local shore-shooter told me he thought it was a Snow-Goose, but having had a good view of it on several occasions between February 1st and March 10th, 1931, I am quite sure that I have identified it correctly as a Pink-footed Goose.

This bird is of a general ivory colour, save that the plumage at a fair distance through glasses appears "crimped". This is due to paler tips to the feathers on the upper-parts. The head is of a darker shade which I should call "biscuit-colour", and there is no trace of dusky on the primaries, which appear to be yellowish-white.

The legs and feet are of that livid shade noticed in the young Oystercatcher, showing a definitely bluish tinge at close quarters. The bill is parti-coloured and is dark at the base. I could not observe the "nail", but the centre seems almost white. The bill is characteristically short. This bird feeds in company with the normal "Pinkfeet", generally with the main body, but occasionally with a little "gaggle" of about twenty birds.

S. W. P. FREME.

GREBES DROWNED UNDER ICE.

THE Great Crested Grebes (*Podiceps c. cristatus*) came to their breeding-quarters in Hertfordshire rather later than usual this year (1931), but on March 4th there were thirty-six on the four pools that constitute the Tring Reservoirs, twenty-two of them in a flock on one pool. By the 8th there was a considerable increase, and on the evening of that day there

were forty-one on this same pool, but the hard weather in the second week of March drove most of the birds away again, and it was not until the ice had nearly disappeared that the Grebes returned, and then not all at once. The aggregate number on all four pools was thirteen on 14th, twenty-four on 15th, thirty-seven on 18th, fifty-two on 21st, and sixty-five on 27th. Of the few Grebes that remained when the waters froze some paid for their temerity with their lives. When the big floes were breaking up on the 14th the bodies of three Great Crested Grebes and a Dabchick (*P. r. ruficollis*) were found frozen stiff in the pack-ice that the wind had drifted into a re-entrant angle in the bank of the biggest reservoir, which had never been entirely frozen. The birds were all in good condition and without sign of external injury. The inference was that when diving near the edge of a floe the birds had travelled under the ice, had been imprisoned and drowned when they strove to reach the surface—a subsequent autopsy by Dr. W. E. Collinge showed that their death was actually due to drowning—and that their bodies had been released and had drifted to the bank when the ice melted.

Five-and-twenty years ago a somewhat similar mishap befell a Dabchick whose actions when swimming in a bath were under observation. Thinking to make the bird more comfortable by providing a place for it to rest upon, I put a bath-cork in the bath, only to find on returning half an hour afterwards that the bird's drowned body was beneath the floating cork.

CHAS. OLDHAM.

ORNITHOLOGICAL NOTES FROM NORTH UIST, OUTER HEBRIDES.

AMERICAN WIGEON (*Anas americana*).—Mr. Hitchcock, proprietor of the Lochmaddy Hotel, N. Uist, has already reported to *The Field* the occurrence of two American Wigeon which he shot on a sea loch at no great distance from his hotel on February 10th, 1931. One of the birds was a very fine adult male in typical rosy plumage, with a full white crown. The other seemed to me to be an immature female. They were killed on evening flight by Mr. Hitchcock, and a third bird flying with them was also brought down, but unfortunately was not recovered.

I had, of course, no difficulty in identifying the drake, but the duck was less distinctive. It seemed to me to be paler on the head and greyer on the general body-plumage than

any Common Wigeon I have handled, and Captain Bernard Howard of Greystoke, who has an extensive knowledge of ducks, agreed with me that it was probably an American. Messrs. Rowland Ward, to whom the birds were sent for preservation, wrote to Mr. Hitchcock to say that they were both undoubtedly American Wigeon. Search was made at my request for the third member of this trio but without success. It had fallen clear of high-water mark, but was not exactly marked, and the Wigeon is so strong afoot that it might have gone any distance.

Previous to this record, very severe gales from N.W. to S.W. had obtained for a considerable period. The birds were fighting to a bed of *zostera* and had been at sea all day by the salty condition of their plumage.

HARLEQUIN DRAKE (*Histrionicus histrionicus*).—On February 13th, 1931, some distance to the north of the Isle of Berneray, Captain Howard called my attention to a duck that was diving in company with a Long-tailed drake. We agreed that it must be a male Harlequin. Broken white face-patches were visible through glasses, and the white neck ring. The water was too rough for us to discern any of the bright chestnut flank colouring, but I am certain that I could see the white half-band from shoulder to breast. The bird dived repeatedly and was some distance on our quarter, but as both Captain Howard and I are very familiar with the Harlequin in Iceland—and indeed at Greystoke, where he has several on ornamental water hatched from Iceland-taken eggs—I do not think there is the slightest possibility of our having misidentified this bird.

GLAUCOUS GULL (*Larus hyperboreus*).—During the first week of February, 1931, a dead gull was found near the coast of Lochmaddy by Mr. Hitchcock and a ghillie. From his description of a great gull as big as a Great Black-backed, but entirely of a dirty white, having no black on the wings, this bird would appear to have been an immature Glaucous.

PROBABLE ICELAND FALCON (*Falco rusticolus* ? subsp.).—On February 12th, 1931, in N. Uist, whilst driving to some ground where numbers of Golden Plover were supposed to be, I saw a Falcon which was very much larger and heavier than a Peregrine. It flew low and slowly from a rock by the hillside and seemed exactly of the figure of the Iceland Falcon, a bird which I know very well by sight. My only doubt as to this bird's identity was its decidedly brown appearance. I have seen many Iceland Falcons ranging from a sort of pale cinnamon—like one now in my possession

—to the usual dark grey notched with white. This bird was far darker than any I have met with, excepting a specimen in a shop window at Reykjavik which puzzled me very much, being as dark as a Buzzard! I think this bird in N. Uist could only have been an Icelfander, but whether Icelfander or Gyr, it was certainly not a Peregrine.

HOUSE-SPARROW (*Passer domesticus*).—I was informed by several inhabitants of N. Uist that the House-Sparrow has only made its appearance during the last few years. Before the War it is said to have been of extremely rare appearance, but is now common.*

WHOOPEE SWAN (*Cygnus cygnus*).—This bird has apparently increased to a tremendous extent. I was assured that about ten years ago there were quite as many Bewick's as Whoopers. Now the Bewick has almost entirely disappeared and large herds of Whoopers frequent every suitable bit of water. They must eventually reduce the numbers of visiting Widgeon, as they uproot a vast amount of the *zostera* on which those ducks live, and when on deep water in a sea loch are attended by Widgeon, which benefit by their wasteful habits. One feeding-place of the Widgeon has already been almost entirely denuded of *zostera*.

PEREGRINE FALCON (*Falco peregrinus*) and RAVENS (*Corvus corax*).—One incident related to me by a ghillie is worth recording. In February, 1930, a Peregrine was fatally injured in a "sparring" match with a pair of Ravens near Lochmaddy. This story, curiously enough, was confirmed by Captain Howard, who happened to have been out on that particular day. The Peregrine had to be "finished off" and was laid by to be collected later for preservation. On the return of the party, however, it was found that Hooded Crows had eaten the body of the Falcon. S. W. P. FREME.

STONE-CURLEW IN SURREY.

As the Stone-Curlew (*Burhinus α . *ædicnemus*) does not seem to be a frequently observed visitor to the London area, it may be worth putting on record that on March 24th, 1931, I put one up on Wimbledon Common in the early morning, at 30 yards distance, and watched it go off to another part of the Common, where I was unable to find it again.*

R. W. HAYMAN.

* Miss E. L. Turner saw a flock of House-Sparrows in Uist at the end of May, 1913 (*Scott. Nat.*, 1914, p. 31), but except for this we have no record of the bird in the island.—EDS.

DOTTEREL IN NORFOLK IN MARCH.

ON March 22nd, 1931, a single Dotterel (*Charadrius morinellus*) occurred on a heath near the north Norfolk coast. It was still in winter plumage, showing only slight traces of chestnut on the flanks and of black between the legs. As is usual with this species it was exceedingly tame, allowing approach to within a few yards. It left during the morning of the 24th after a sharp fall in temperature and a rapidly rising barometer, the wind being N. to N.E.

This appears to be an unusually early date of arrival in this country.

RONALD M. GARNETT.

BLACK-TAILED GODWIT IN ORKNEY.

It may be of sufficient interest to note that I saw a Black-tailed Godwit (*Limosa l. limosa*) on the beach at Scapa Bay on February 22nd, 1931. I raised the bird thrice and on the last occasion got within 30 yards of it and had a good look at it through my field-glasses, both while sitting on the rocks and as it flew away. The length of the legs compared with a Bar-tailed Godwit was very distinctive, and the tail was distinctly black with no barred markings. I have never seen a bird of this species in Orkney before, and I have been observing birds for fifty years.

DUNCAN J. ROBERTSON.

[Except for a doubtful record mentioned in the *Vertebrate Fauna of the Orkney Islands* we know of only one previous occurrence of the Black-tailed Godwit in Orkney—a bird seen by Messrs. J. R. Hale and T. P. Aldworth in June, 1910 (*Brit. B.*, Vol. IV., p. 221).—EDS.]

IVORY-GULL IN COUNTY DOWN.

IN view of a report from Mr. A. J. Kennedy, lighthouse-keeper on the Copeland Islands and a keen observer, I visited Donahgadee, co. Down, on April 3rd, 1931, and was fortunate to be able to confirm his very interesting record of the occurrence of the Ivory-Gull (*Pagophila eburnea*). On my arrival, at high-tide, a flock of some 200 Black-headed and Herring-Gulls, with a few Kittiwakes, were feeding close inshore below the sea-wall of the promenade, and conspicuous among them was the Ivory-Gull. For upwards of an hour I had this bird under short-range observation with glasses, and was struck by the intimacy—one can use no other word—between it and the Herring-Gulls. Taking flight at occasional alarms, the Tern-like manner of the Ivory is very

noticeable, although this particular bird was subdued and by no means noisy. Contrasted with the Black-headed Gulls when sitting on the water, the somewhat greater length and more slender build of the Ivory appear accentuated; while in flight its superior grace and lightness of wing not only distinguish it from this species but afford it a definite advantage over such aerial masters as the Herring-Gulls, its larger associates.

Mr. Kennedy states that he saw the bird on March 1st, 2nd, and 3rd, and again from the 24th to 29th, when he returned after an absence.

C. BLAKE WHELAN.

GREAT CRESTED GREBE ENQUIRY.—Readers are reminded of this enquiry, details of which were given in the February issue of *British Birds* (*antea*, pp. 249-254). It is sincerely to be hoped that all readers will assist, and it may be remarked that negative evidence, as well of course as positive, is required to make the enquiry complete and comprehensive. A schedule was issued with each copy of the February number, but additional ones, if needed, or further information, may be obtained on application to Mr. T. H. Harrison, Pembroke College, Cambridge.—EDS.

NOTICE TO RINGERS.—Those who have been trapping during the past winter and have retrapped ringed birds are asked to apply to 326, High Holborn, for a special form on which to record their recaptures. This form is *not* intended to replace the ringing schedules, but is to be used for lists of local recoveries.—H.F.W.

GREAT GREY SHRIKE IN OXFORDSHIRE.—Mr. E. L. King informs us that on April 6th, 1931, he had a close view of a Great Grey Shrike (*Lanius excubitor*) which was perched on the top of a hawthorn hedge on Otmoor.

HOOPOE IN SURREY IN MARCH.—Mr. E. C. Rowberry informs us that on the afternoon of March 22nd, 1931, he and his wife watched a Hoopoe (*Upupa e. epops*) at close range for fully five minutes in N.W. Surrey. This is an early date for the bird's appearance.

BLACK-NECKED GREBE IN SOUTH WALES.—With reference to the note on this subject (*antea*, p. 342) Mr. E. H. Mills informs us that he has a specimen in his possession which was shot on October 22nd, 1926, on the estuary near Carew Castle, Pembroke.

GREEN SANDPIPER IN SUSSEX IN WINTER.—Mr. H. Whistler informs us that he twice flushed a Green Sandpiper (*Tringa ochropus*) on February 17th, 1931, in the marsh below Winchelsea.

REVIEW.

Nicoll's Birds of Egypt. By Colonel R. Meinertzhagen, D.S.O. 2 vols. 4to. (13×10.) Plates and text figures. (Hugh Rees.) 30s. net.

IN his preface Colonel Meinertzhagen states that he has endeavoured to make this book a fit and worthy memorial to his friend, Michael Nicoll. This he has certainly done, and a fine and comprehensive work is the result; and we may add that the Egyptian Government, under whose authority it is issued, have evidently been generous, and have made it possible to publish so large and fully illustrated a work at a price impossible without very considerable financial assistance.

In 1919 Nicoll published a *Handlist of the Birds of Egypt*, which was admittedly merely a beginning to pave the way to a comprehensive account of the subject. Unfortunately, Nicoll's lamented early death prevented his writing more than a small portion of such a work, but he left many valuable notes and, as Colonel Meinertzhagen states, an unrivalled collection of birds (at Giza), and without this collection the systematic portion which forms the basis of this work could not have been written. Colonel Meinertzhagen's task has nevertheless been a heavy one. The present work deals with what now comprises the kingdom of Egypt from Cyrenaica to the Red Sea, as well as the Peninsula of Sinai, a vast and varying country, which the author divides into no less than six faunal areas. While the birds of the Nile and the Faiyum were well known, there were many parts of the kingdom which had not been ornithologically explored, and Colonel Meinertzhagen was enabled, with the assistance of the Government, to fill the more important of the gaps by visiting the western coastal area, Upper Egypt, the Red Sea, various oases and the Sinai Peninsula.

From the result of these researches, combined with a re-examination of Nicoll's collection, his notes and past work on the subject, Colonel Meinertzhagen has produced a very full and valuable work, which will be greatly appreciated by ornithologists.

In the systematic portion we have under each form a brief description, a general idea of its distribution, and a more particular account of its range and status in Egypt, notes on nidification, if it breeds in the area, some excellent paragraphs on field-characters and references to allied forms. Keys and a short synonymy are also provided. The author shows proper discrimination in accepting records, and we quite approve of his rule not to add definitely to the list a bird which has been only seen. For instance, the Pied Wagtail, which always seemed to us a most doubtful occurrence, is relegated to a note within square brackets, although it rests on an observation made by Nicoll himself, who was one of the best men in the field there ever was, but it must be remembered that there are other forms of *Motacilla alba* which have black on the upper-parts.

There are some valuable preliminary chapters to which attention must be drawn. These include accounts of physical geography and

geology (with maps), evolution (a section which seems rather out of place) and the origin of life in Egypt. An illustrated section, which has been undertaken by Mr. R. E. Moreau, deals with the birds of Ancient Egypt, and this will interest many. It aims at giving a complete list of identifiable species from inscriptions and scenes on the monuments and from mummified birds. There is also a chapter on Bird Protection in Egypt, but that on Migration will perhaps be of chief interest to ornithologists. In his preliminary remarks on this subject, it is of importance to note that the author states that all evidence goes to show that Egypt and Sinai draw their migrants from the north, and especially from the north-east and *not* from the west. Corroboration of this is afforded by the fact that notwithstanding the tremendous slaughter of migrants in Egypt for many years, only three birds ringed in the west have been reported, viz., a White Stork from northern Germany, a Pintail from the Volga, and a Red-backed Shrike from Denmark, this last being a remarkable record.* A section on Migration within Egypt by Mr. R. E. Moreau is of considerable interest. The most notable point of this is that very few observations have been made outside the Nile valley, but that those few which have been made (mainly by Mr. Moreau or at his instigation) show that a multitude of birds migrate across the deserts even over their worst areas of sterility. Dr. Hartert's observations in the western Sahara in 1912 showed that numerous migrants crossed that part of the desert, and these two sets of observations afford further facts in support of our belief that migration proceeds on a very broad front and that so-called routes, such as coast-lines and river-valleys, are merely areas where birds are concentrated (probably for varying reasons) and therefore more obvious.

The work concludes with a number of appendices and is well illustrated with plates and text figures by Messrs. G. E. Lodge, H. Grönvold and Roland Green.

It is impossible here to discuss the book in further detail, but we hope that enough has been said to show that Colonel Meinertzhagen is to be much congratulated on having produced a very excellent and important piece of work.

H. F. WITHERBY.

* In a review of the book in *The Ibis* it is stated (1931, p. 384) that a Swift marked at Suakim was found dead at New Ross, Wexford, in May, 1886 (*Field*, May 29th, 1886, also quoted in Ussher & Warren, *Birds of Ireland*, p. 103). This refers to a bird which, when picked up, is stated to have had a piece of paper tied under its tail bearing the inscription "Mary Elsam, Suakim, Egypt, 10.3.86." So far as we know there is no evidence that the piece of paper was fastened to the bird at Suakim and there seems no good reason for taking such a record seriously.



LETTERS



NUTHATCH SHELTERING YOUNG FROM SUN.

To the Editors of BRITISH BIRDS.

SIRS,—With reference to the observations of Mr. J. H. Owen and Mr. Ralph Chislett on birds protecting their young from the direct rays of the sun (*antea*, pp. 261 and 302), the following evidence may be worth recording.

Last year a Nuthatch (*Sitta e. affinis*) nested in a nesting-box fixed low down on the trunk of an oak tree within sight of my window. The first egg was laid on May 1st; there were five eggs on May 5th; the nest was not looked at again until the 25th, on which date it contained five very small young, which looked as if they might have been three or four days old.

This nesting-box is exposed to the afternoon sun. Looking towards it on the afternoon of June 3rd I noticed that the black disc of shadow representing the entrance hole, usually so conspicuous, seemed to have disappeared. Going up to the box quietly to investigate, I found that the hole was completely stopped by the breast of the Nuthatch, which was clinging across it on the inside, her claws grasping the lower rim of the hole, and her puffed up feathers filling it. A spell of fine and hot weather followed until the young left the nest (which they did on June 15th, forty-six days after the laying of the first egg), and during afternoons when the sun was on the box she did the same thing daily.

The particular box is a shallow one (it is, to be exact, a round tin cased in thick bark lashed round it with wire), and the ray of light entering the hole must have slanted almost directly on to the young birds a few inches below it.

I missed the point of the bird's action myself, imagining that she was airing her breast after brooding her young in the heat and stuffiness of the nest, and I am indebted to Mr. Jourdain for the much more probable suggestion that she was intercepting the ray of light.

I should imagine that birds which nest in holes rarely require to protect their young from the sun, but, apparently, they recognize and meet the need when it arises.

A. L. BUTLER.

HORSHAM, *March 22nd*, 1931.

THE SOARING OF THE CHOUGH.

To the Editors of BRITISH BIRDS.

SIRS,—In *British Birds*, Vol. XXIII., p. 59, I notice that the editors, in a footnote to Colonel B. H. Ryves's comment on the above, state that Ussher (*B. of Ireland*, p. 84) appears to be the only author who refers to this soaring flight. May I remark that I made allusion to it in *Field-Studies of some Rarer British Birds*, pp. 77-8, thus: "again they (a pair) climb high into the heavens and sail round each other in slow, stately spirals, or soar head to wind, in this way mimicing a favourtie habit of the Raven and many of the Raptors."

JOHN WALPOLE-BOND.

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